Universities Quarterly

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MAURICE BOWRA

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N. R. HANSON

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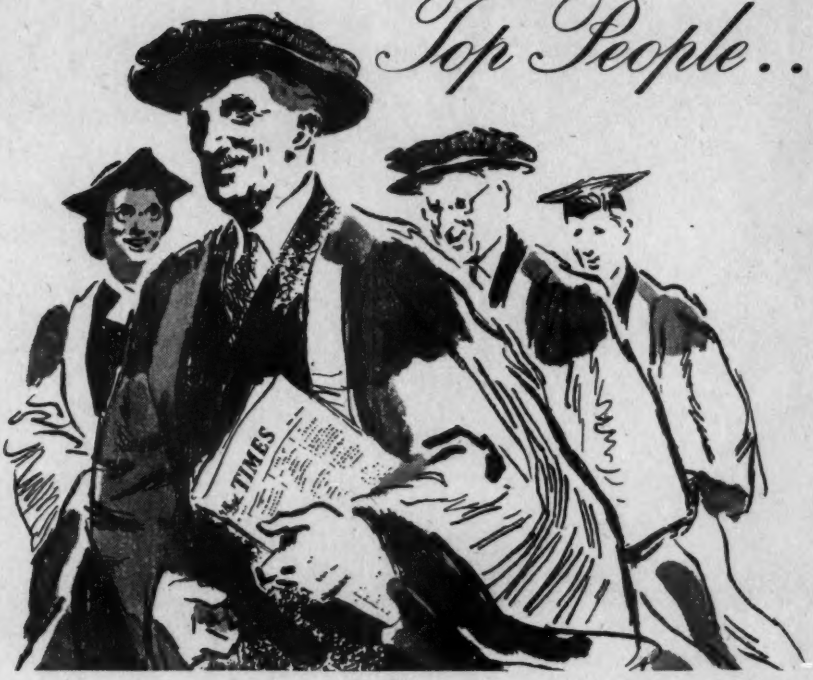

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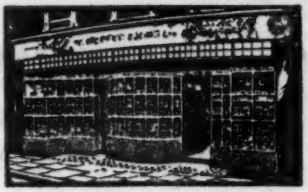

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Universities Quarterly

UNIVERSITY COMMENTARY

MAURICE BOWRA

Warden of Wadham College, University of Oxford

THE POLITICAL crisis in which we have lived since the summer has disproved the popular theory that dons and undergraduates are no longer interested in politics. If dons have hurried into print to denounce or to defend the government's policy on Suez, undergraduates have displayed an astonishing enterprise and skill in providing succour for Hungarian refugees. Suez has divided academic communities more violently than any issue since Munich, and it is right and natural that dons should feel a powerful impulse to express their opinions. What is less creditable is that they have been denounced for doing so and told that they should keep silence since they belong to institutions in which all kinds of opinion flourish. If we press this to its logical limit, it means that nobody who belongs to any institution has a right to speak on a controversial matter and that public pronouncements on political subjects should be forbidden alike to bishops and judges, to railwaymen and postmen. It is perhaps hardly relevant to point out that the accusations are made by those who hold the opposite opinions and would no doubt allow to their own side a liberty of speech which they would deny to their opponents. What matters is the assumption that a class which ought, from its training and its duties, to be independent and well informed is thought for this very reason to be dangerous. The doctrine that the men in power always know best and should not be criticised even for their own benefit is not one that students of recent history are likely to accept, and it is completely opposed to the democratic conception of liberty. Recent outbursts have shown that too many people are unaware of this and that our complacent assumptions about our national love of liberty are no substitute for an active and vigilant belief in it.

The immediate and unqualified response of members of British universities to the sufferings of their Hungarian fellows is a glowing tribute to the growing solidarity between students of all nations. It owes much to the various bodies which bring students from abroad

to this country, and more to British students' determination and enterprise in vacation travel in Europe, and their consequently increasing understanding of European countries. For them the revolt in Hungary was not a remote event in an unknown country but something very close to themselves. They felt that this was indeed their cause and their battle, and that they must exert themselves to the utmost to help in it. The knowledge that a whole generation of their own age has been driven desperate by privations, espionage, and brutality has made them vividly conscious of their own advantages and eager to extend them to others less fortunate. The skill and speed with which British undergraduates have organised relief-funds and helped to house and help refugees shows that they know how to translate their ideals into action and get things done quickly and efficiently. The autonomy of junior common rooms and student unions has yielded an unexpected dividend in a greatly increased ability to co-ordinate complicated enterprises and to see that the utmost is made of existing resources.

One disturbing and depressing result of the Russian intervention in Hungary has been in Russia itself. In the spring and summer visitors from abroad were able to meet university students and found them remarkably outspoken and independent. In September not only the Rector of Moscow University but the Minister for Higher Education welcomed a proposal from the Vice-Chancellor of Oxford that a party of Russian teachers and students should visit his university in July, 1957. The invitation is in abeyance since it is doubtful whether anyone will be allowed to come, and even if some are allowed, they will certainly not be free to say and do what they wish, without having later to pay for it. Indeed there are ominous signs that the Russian government has begun to apply to its own students some of the methods which have had so tragic consequences in Hungary. For a short time it looked as if intellectual exchanges with Russians could be conducted with some freedom at all levels; it is now clear that this is no longer the case and that we have gone back to the old fear, suspicion, and obstruction. The loss to science and learning is disastrous. Each side has much to learn from the other, and though books and periodicals can still do much, they cannot compensate for free discussion.

More about Technology

Dr. B. V. Bowden, Principal of the Manchester College of Science and Technology, has written a highly readable booklet on the proposals for the development of his institution. It is indeed much more

than this. It argues, with unanswerable force, the case of a great expansion in technological education and gives many facts and figures which cannot be generally known even in academic circles. He is rightly concerned about the teaching of science in schools and about the inadequate number of scientists produced by universities. The first, of course, is a result of the second, and surely the cure for this is for the universities to give more scholarships in science. The extension in this century of college, university, and state scholarships to a wide range of subjects has greatly increased the number of students in these subjects, and there is every sign that a more determined policy in science scholarships would turn the attention of girls and boys at school to the possibilities which lie before them. Dr. Bowden states an *ex parte* case, and no sensible humanist will resent some of his admirable jokes at their expense, or even his remarkable claim that at Oxford there are eleven professors of classics. More questionable is his contention that, though of course scientists should have some knowledge of the humanities, this can best be done by studying the history of technology: though in saying this I am anticipating the lengthy discussion of the question that appears later in this issue.

This surely is to misunderstand the whole problem. The need is to make the humanists more acquainted with science, and the scientists with the humanities, not to encourage each side to burrow deeper into its own origins. Dr. Bowden also raises a point of fundamental importance. He aims at having in 1962 more than 1,200 students. So far, so good. But he then goes on to say that 'we should not aspire to grow so fast as to overshadow the rest of the University'. Why not? Surely if technology is as important as he argues that it is, it should not be limited by its relation to the University. In the last resort, there is no reason why his Institute should not, like M.I.T. and Charlottenberg, both of which he greatly admires, become independent and create its own high standards and give its own highly prized degrees. The Committee of Vice-Chancellors and the University Grants Committee may at present have qualms, but in the face of our national need will they continue to have them?

'How They Fared'

In his pamphlet *How They Fared* the Vice-Chancellor of Liverpool analyses some important facts in the academic progress of students in his university in 1947, 1948, and 1949. He introduces his subject with great care and moderation and relies for his demonstration on

some highly informative and illuminating tables. His candour may well expose him to unmerited attacks, but we are all greatly in his debt for his fair and fearless analysis of the situation. He is naturally enough concerned with what looks like a high percentage of failures and with the possibility of criticism that public money is being wasted on students who ought never to have gone to a university. He rightly argues that the causes of failure are manifold and that it is impossible to lay down general laws for it. His own creation of a Progress Committee shows how well he watches over the fortunes of his students, and other universities and colleges might well follow his example. He is fully aware of the difficulties which many students encounter at home, of the lack of teaching aptitude in some lecturers, of the advantages of a tutorial system. But he clearly feels that the fundamental problem is that of selection. Anyone who has conducted entrance examinations will know how difficult this is. Even the scholarship examinations at Oxford and Cambridge, which are extremely careful and thorough, bring home almost as many geese as swans, and anything less searching is bound to be even less successful. Experience helps; insight may sometimes be found. But the problem remains unsolved. Is not the solution perhaps to conduct more careful scrutinies of students when they are already at the university and to see that, if they fail, it is really their own fault and not that of their teachers or their institutions?

What it Costs

The Grants and Welfare Department of the National Union of Students has conducted a survey of the expenditure of post-graduate students at the universities of Oxford, Cambridge, London, Birmingham, Leeds and Sheffield, and the first impression which it makes is of an extraordinary lack of system in the arrangements. Grants vary from £40 to £400 a year, and are calculated in many different ways. No doubt these inequalities will disappear when the Ministry of Education and the D.S.I.R. take over responsibility for awards, but many important problems still remain. Grants surely should include some allowance for books, make holidays possible, and not be too critical of other emoluments and prizes. Some latitude might even be allowed to private earnings.

THE EDUCATION OF THE TECHNOLOGIST

1. SCIENCE AS A LIBERAL EDUCATION

NORWOOD RUSSELL HANSON

Lecturer in Philosophy of Science, University of Cambridge

RECENTLY there have been many references to a contrast; that between the requirements of the nation, and those of the universities. In the race for survival, Britain's clutch is apparently slipping. America and Russia are ahead in training scientists and technologists. Thus it is asked whether the universities are doing their part. This is a crisis. We need scientists and technologists, well-educated or not. If the universities possess unexploited facilities for producing such men, they cannot be allowed to carry on as they please. They must be harnessed to the national effort. An educational philosophy is a luxury we cannot afford.

This argument is countered with equally trenchant replies, e.g. in the recent B.B.C. talks entitled 'The University has no Purpose', by Mr. Peter Winch. The disputants may, however, be at cross purposes. For consider this question: 'What would the well-educated technologist be like?' If hammered into discussions of education and technology, this might show that many different issues were under discussion at once. My aim will be to sort out some of these issues and to examine the *idea* of a technological education.

Before I can do this, however, certain familiar ambiguities must be resolved. These can best be attacked as contrasts, or dichotomies. Though implicit in much talk about education, they are rarely considered at close range.

Specialised versus Educated

It is sometimes supposed that a specialist cannot be well-educated; that being specialised rules out being informed, intellectually curious, imaginative, and interested in the work of others. Of course, many specialists are *not* well-informed, nor curious about other's pursuits; nor are they imaginative. But the dichotomy is still untenable. Plenty

of specialists are thoroughly civilised. There is also the stronger point that almost anyone who might today be thought well-educated turns out to be a specialist; Einstein, Russell, Murray, Trevelyan, Heisenberg, Schrödinger, Bohr, Darwin, Mill, Hume, Gibbon . . .? The list is long. But it is a list of masters of special disciplines. However, they have complemented mastery of one field with an awareness of its place in a wider field of human, social and intellectual considerations. The versatile giants of the past — Leonardo, Michelangelo, Newton — they were not men who avoided specialisation. Their greatness rests in the fact that they were the most technically accomplished specialists of their day, not in one, but in several fields simultaneously. Theirs was not the smattering of 'culture' that some equate with having a good general education. By that standard, no one above would qualify. Only the deliciously unlearned dilettante meets such a requirement. This picture of an articulate factotum appears to some immediately they think of a well-educated man, a superficial conception, without any doubt.

Specialist versus Arts

It is not uncommonly held that a person trained in e.g. history, philosophy, classics or archæology, is well-versed in the things that matter and, hence, not a narrow specialist. How does this myth survive?

Russell, Murray, Trevelyan, Mill, Hume and Gibbon were clearly specialists; well-educated arts specialists. Alas, for every one of *them,* however, there are two hundred other arts specialists who may have no claim to being well-educated. We have all known Greek grammarians, lawyers, musicians, logicians, theologians and historians (of all manner of minutiæ), of whom it would be rash to say that they were well-informed, intellectually curious, imaginative, and interested in other people's work. There is as much likelihood of *narrow* specialisation in arts subjects as in the sciences.

Scientific versus Educated

It is implicit in some discussions that if a course of training is scientific, then it cannot constitute an education. At Cambridge, and more so at Oxford, resident scientists are sometimes spoken of as peripheral interlopers on the real business of the University. The problem becomes how to work an education into scientific training; the two being regarded as mutually exclusive. But it does not follow from a

man's being a scientific specialist that he cannot be humanized; the specialists above would qualify on any criterion. However, it might be conceded that though it is not *impossible* for one man to be both a scientific specialist and well-educated, it is very unusual. When it happens this only shows that, in addition to mastering their special sciences, men like Einstein, Russell and Heisenberg, by hard work and genius, manage to acquire the further skills which excite our admiration. They were able to get several educations while their contemporaries were struggling to get one. They are therefore, inappropriate in a discussion of education. Geniuses and beavers are not the issue. They take care of themselves. We must worry about those with time and ability to acquire but one education. Is it not then, plausible to argue of *ordinary* folk, like ourselves, that if their education is intensively scientific they may fail to develop the curiosity, imagination and interest which constitute being a well-educated man?

This forces forward our leading question: 'What would a well-educated technologist be like?' And it prompts further queries like 'What is the idea of a university?', 'What is education in twentieth century Britain for?', 'How much will we give up to remain a world power in the scientific and technical fields?', 'Is the only way of keeping up in these fields to increase the quantity of scientists and technicians?'

This array of questions marks as fatuous some of the hard-headed proposals concerned with tacking bits on and taking bits off curricula in schools and universities. Until these queries are forced into the open problems concerned with liberal education in a technical age will not be solved; they will only be disguised while bustling men of action hack away at the periphery of the issue. I must now say something on each of these points, since I have thrown them down with the taunt that they are really fundamental questions.

What is the idea of a university? There have been treatises on this subject by some very learned men. They are not unanimous in their verdicts. All would agree, however, that there ought to be some difference between a university and a technical college. The university is not a place where only manual dexterity is mastered — even dexterity which is complex and requires the keenest perception. This points up a contrast central to what follows. This is between the *technologist* and the *technician*. The Government's White Paper on Technical Education makes this distinction fundamental. Differences between a university and a technical college show themselves in simulacrum here

between the technician and the technologist. The Paper defines the technician as a man 'qualified by specialist technical education to work under the general direction of a technologist'. The technologist, however, is 'qualified for membership in a professional institution'. He is able to initiate practical developments in industry, and 'to push forward the boundaries of knowledge'. This distinction between pushing forward the boundaries of knowledge and working competently to implement the ideas of others is the key to all the questions so far raised. One may not agree with this contrast. But it does allow one to deal with inter-connected problems by way of inter-connected answers — not a medley of unrelated calls to action.

Ideally, then, the university encourages individuals to push forward the boundaries of knowledge. How? The student is made to see that the syllabus is not a set of rails from which one deviates only at his peril. It is a very wide river. It must be navigated independently by each individual. He must rely largely on his own judgment. The student must assess for himself his local difficulties — what intellectual eddies and conceptual cross currents trouble him, and what ideas bubble and gleam so as to interest, excite and attract him. There is but one monotonous way to traverse the syllabus construed as a set of rails. Infinite channels are open to him who discerns (in time) that he is in sole charge on a swift, but navigable river. Some undergraduates never learn this basic geography of the university. They think the genial advice of their tutors and supervisors to be just like the reprimands of their schoolmasters when they were in danger of getting off the rails. Though they work like beavers they may still drown in the oblivion of a poor degree. They had not perceived quickly enough that they alone were steering, no one else.

That is, the undergraduate must be cut adrift if ever he is to gain independence and mastery of his own problems. Without these no boundary of knowledge will even be approached, much less advanced. There are no rails to discovery. It always results from independent choices and individual judgments concerning perplexities arising in one's special line of work. The entire conception of a university rests on offering to young men and women the opportunity to develop traits needed for carrying on independent research in some special field of knowledge. Not every student *does* develop in this way. Still less does everyone go into research. But unless this were a primary intention of a university — unless it provided every facility for launch-

ing young minds on a voyage of independent thought — it would be no more than a finishing school offering VIIth to IXth forms, or a degree factory, or a marriage bureau. There is no shortage of such institutions in America. There are signs in the development of certain university colleges (those geared to something called 'general education', something which depends on the pre-digested survey course), that Britain, too, may soon be stocked with such places. These are not concerned with developing habits of independent thought. They seem more interested in pushing their charges along rails towards some kind of qualification. Unfortunately, the qualifications they are awarding prepare their graduates only to understand the orders given by other people who have the ideas. All nations should ask themselves whether their degree-conferring institutions are really universities which allow syllabus-guided schoolboys to become idea-exploring men, or whether they are simply larger schools for boys who have finished their national service.

If technologists are as the White Paper defines them, then the universities have a responsibility towards them. This is to supply a technological education in the fullest sense. For in a technical age it is from such men that tomorrow's independent thinking must come. These are the men who must learn early what it is like to face one's own problems, with nothing between themselves and failure except their own wits, perception and judgment.

This is the crucial point: the independence and confidence one gains in becoming a specialist expert, a virtuoso, in e.g. aeronautical design, will be just what the university shows him how to employ when trying to understand the work of other people. The university, ideally, shows the confident specialist how to keep as well-informed about the world as he seeks to be in his own profession. That is, his independence of mind gives him the intellectual curiosity, boldness and imagination needed to understand what is new and old, in neighbouring disciplines, e.g. nautical design, steel architecture — and ultimately, even in disciplines remote from his own. In short, it is the university's capacity for making a man into a creative *specialist,* which imbues him with what is required to understand the ideas of other specialities. Run him only on rails, stoke him on slow-burning survey courses robbed of all spark (so the Third class man will not burn himself), and he will never lose the 'school certificate feeling' that knowledge is an inexhaustible library of incomprehensible books, lacking in mystery and excitement, to be mastered only by the school swat. A

university so conceived will only be a place where the rails go a little more steeply; an obviously necessary adjustment if one is going to get higher (socially and economically) than those who lack the paper qualification such a university has to offer. Graduates of such a place may never feel the adventure in learning, in discovering. They will never know how a university differs from school on the one hand or from the technical college on the other.

What, then, would a well-educated technologist, e.g. a well-educated aeronautical engineer, be like? One can do no better here than to paraphrase and enlarge upon the remarks of Sir Eric Ashby, in *Research*, 1955:

> Suppose a student decides to take up the study of brewing; his way to acquire general culture is not by diluting his brewing courses with popular lectures on architecture, social history, and ethics, but by making brewing the core of his studies. The *sine qua non* for a man who desires to be cultured is a deep and enduring enthusiasm to do one thing excellently. So there must first of all be an assurance that the student genuinely wants to make beer. From this it is a natural step to the study of biology, microbiology, and chemistry; all subjects which can be studied not as techniques to be practised, but as ideas to be understood. As his studies gain momentum the student will naturally become interested in the economics of marketing beer, in public houses, in their design, in architecture; or in the history of beer drinking from the time of the early Egyptian inscriptions, and so in social history; or in the unhappy moral effects of drinking too much beer, and so in religion and ethics.

The brightness of Sir Eric's reflections have been misunderstood. He has captured here a sunbeam of educational philosophy. His words make it clear that the way to educate, e.g. our aeronautical engineer, is not to tack cultural afterthoughts onto an already jammed curriculum, but to help him to find new depths and dimensions in his own special studies. Why should not any young man who wishes it be able to become an aeronautical engineer in the fullest possible sense? Why should he have to settle for anything less than becoming an adventurer in aeronautical ideas? For this the university does not need to soak him in Proust and Sartre, nor Wittgenstein or Wordsworth; no man can know everything. What we call a person's intellectual character is only the reverse image of what he chooses to be ignorant of. The *well-educated* aeronautical engineer cannot be one who knows everything,

not even a bit of everything. He is rather one who knows a great deal about all aspects and many ramifications of aeronautical engineering; the principles of flight, the history of aviation, the physics of liquids and gases, the economics of commercial and military aircraft production, the role of the aeroplane in peace and war, the international scene as it has been changed by the fact of aviation. Aviation can be the core of our engineer's studies. He can develop a deep and enduring enthusiasm for aeronautical engineering in all its forms. He will aspire to be the most excellent of aeronautical engineers. The ideal university will take such a man and show him the river which lies ahead. It will then cut him loose, to find his own problems, try his own ideas, and above all, to make his own mistakes — always with the assurance that expert advice, suggestions and critical appraisals are ready whenever he wishes to avail himself of them.

It is into such a pattern as this, for instance, that a course which might have the hypothetical title 'History and Philosophy of Aviation' could fit well. It would not be a changing of the subject — the student's nose would not be rubbed into Roman law or Sophocles, in the name of *education*. What he will do is to come to see his ideas, his aspirations, his flights of fancy, against the broader field of human endeavour. Such a course must deal with the times and thought of every man since Aristotle who has thought about flying — Archimedes, Bacon, Leonardo, Galileo, Kepler, Newton, and all the incredible balloonists and birdmen of the eighteenth and nineteenth centuries. What drove these men to their ideas, and many of them to their deaths? In short, we must trace the *idea* of flight in the conceptual background of our western predecessors. The course would also scrutinise the logic of arguments set out by engineers and draughtsmen concerning the possibility or impossibility of certain modifications, or the advisability of pursuing or not pursuing certain lines of thought and development. It would, e.g. consider the genesis, the data and the arguments which support the new 'area-rule' principle of aircraft design for trans-sonic aeroplanes like the Convair F102 and B58, the Gruman F11 and the Supermarine N113. It would examine the assumptions behind arguments in favour of pure-ram-jet development, or further work on by-pass engines or turboprops, or jet-tipped rotors. It would branch inevitably into a discussion of form — the 'æsthetics' of the ideal flight body. It could lead also to discussions of the zoology, physiology and anatomy of bird flight, of bat flight, of insect flight — and of the aerodynamical aspects of the glid-

ing prowess of the condor, the albatross, and even the prehistoric archæopterix and pterodactyl. How, indeed, could these things be kept out of a course designed to let an aeronautical mind range as widely as possible around its chosen subject? Courses of inquiry other than in the History and Philosophy of Aviation, might be of a more economic, political, physiological or psychological variety. The field is limitless. What is startling is that few existing universities could even begin to deal with the young aeronautical engineer in this way. Most aspects of the hypothetical course mentioned are themselves matters for current research. They are not courses of inquiry stocked with well-worn textbooks, traditions and orthodox teaching techniques. From his first day in such an intellectual environment the freshman aeronaut is a creative thinker — of necessity. Such a man could not but become both a good aeronautical engineer and a highly educated person. Why is this so?

This young engineer will have found in aviation an organising principle, a kind of 'conceptual *Gestalt*' or pattern around which all his other interests, curiosities and flights of imagination might be organised. In the ideal university, all specialised courses of training would be understood in this way. They would be what cements into one corpus of knowledge the several related component interests which go to make up a well-educated man.

The modern crisis in technological education has not really forced any radical alterations in our established ideas as to what constitutes a good education. It has rather just revealed more clearly than ever before something that has always been present in a good education; a single set of special interests which give an intelligible organisation and pattern to the experience and learning a man collects before he reaches the age of twenty-five. The alternative to this conception is, I feel, the production of men with generally diffused interests, intellectual-jacks-of-all-trades-but-masters of-none. They will lack rhyme, reason and system in their ideas, because they lack sufficient mastery and confidence with any one set of concepts which might have served as the organising principle for the rest.

All this is mirrored in the findings of experimental psychology. A percipient who waits for a stimulus with a generally diffused alertness rather than a confident expectation of what sort of thing to look for and where to look for it, will be much slower and less sure of the identifications he attempts than had he possessed a working pattern for the arrangement of his experiences. The history of science is

studded with examples of men who simply failed to observe things we now regard as obvious. The framework of their ideas gave them no expectations of such phenomena. Their observations lacked a conceptual pattern against the background of which certain features of their experience would stand out for them as significant, or relevant, or worthy of further inquiry. Without something like this to organise one's education (without a real speciality), very little can be expected to stand out as significant, relevant, or noteworthy. The result? The deliciously unlearned dilettante, the articulate factotum, the well-turned-out gentleman of Olde Englande.

What the universities must do is to realise that in purely scientific and technological courses they have a rich opportunity for providing education in the deepest sense. The best university scientists and technologists would then be not men whose natural endowments and interests have been *limited* by the choice of a special competence, but rather men who have come to regard their specialities as patterns for a wide range of cognate specialities, professions, problems and facts. Such men stand the best chance of being just what every nation needs more of, independent original thinkers whose deep understanding of a special discipline, in a broader context of related disciplines, is a certain source of new ideas in the future.

A well-educated technologist, then, would be like any other well-educated person. But the wider elements of his life would be organised around technological rather than historical or classical subject matters. A university is ideally a network of conceptual streams. These, undergraduates must learn to navigate with independence and boldness if the undiscovered ocean of truth (of which Newton spoke) is ever to be ruled. As to the question, 'What is education in twentieth century Britain for?", it ought to be for infusing into young people something of the spirit of intellectual adventure and excitement which marks every advance in the history of western ideas. Their eyes should be opened to the seas of unsolved problems before them. (No one can resist becoming drowsy on long, tedious rail journeys.) Britain need not worry about the future once its youngsters realise that that future will be determined not by natural resources and machines, but by ideas alone.

'How much are we prepared to give up in order to remain a world power in the scientific and technical fields?' We certainly must give up the idea that where technology begins education stops. It is where specialised work in science and technology begin that dilettantism

stops — but this was true also of any programme of study designed to give advanced training in, e.g. classics, or in philosophy, or in history.

We must also give up the idea that it is all a question of quantity. Does it follow from the fact that America and Russia produce about five times more scientists and technicians than Britain does that they will therefore produce five times the number of scientific and technical ideas, or that their ideas will be five times better than those of Britons? This is a question to which one answer is 'Wait and see!' Another indirect answer is given in the fact that at the moment the world's absolute air speed record is held by the British Fairey Delta II, and that the world's absolute height record is held by an English Electric Olympus-powered Canberra; these are two of the three major world records for aircraft. The world's land speed record is held by Britain, and so is the world's water speed record. In pure science, physics for example, Britain has always been short of equipment and machines. This did not prevent the birth, the education and the ideas of Boyle, Newton, Priestley, Dalton, Faraday, Clerk Maxwell, the Thomsons and the Braggs, Rutherford, Dirac, Chadwick . . . without whose bold and independent ideas the history of physics might have read very differently today from what it does. This is no argument for complacency, but it hardly reads like a counsel of despair.

Technological and scientific success is with nations as it is with men, primarily a matter of the quality of ideas. Only secondarily is it a matter of the quantity of B.Sc.'s. The quality of a man's ideas in a technical or scientific pursuit, moreover, can only improve as they rub against the ideas of others in neighbouring pursuits.

A liberal education in a technical age is no different in principle from a liberal education in an agricultural age, or an artistic age or a classical age. Contexts change, but the well-educated man is always the one whose special interests are the lens through which he can view a large area of the world around him.

2. THE HUMANITIES AND THE TECHNOLOGIST

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ONE of the troubling things about Mr. Hanson's paper is his failure to give any satisfactory answer to his culminating question, 'How much are we prepared to give up to remain a world power in the scientific and technological field?' The question implies that we must at least give up something: it also implies that there are values other than that of remaining a world power and that there is a limit beyond which we should not go in sacrificing them. Mr. Hanson does not say what these values might be, and his question leaves us guessing as to what he might have had in mind. One guess is that to hold supremacy in the technological field a considerable proportion of people with first class minds who are at present serving society by devoting themselves to the study of such subjects as history, economics, literature, and philosophy, and to the inspiration of political and managerial wisdom would have to abandon these pursuits and devote themselves to technological studies. Another guess is that we would have to give up the general cultivation of those who will be needed as technicians and technologists (presumably an appreciable proportion of the population) by means of such studies as history and literature, and require them to devote their whole time to technical study. These possibilities are not explicitly mentioned by Mr. Hanson, though his argument can be taken as directed towards lessening the apprehension they arouse in many people's minds. All that he specifically mentions as things we must give up if we are to retain world power are some ill-conceived ideas which we should be ready to forgo: such ideas as that 'where technology begins, education stops', and that the problem of educating scientists 'is all a question of quantity'.

What in effect Mr. Hanson wants us to give up are our traditional methods of technological education, which he insists do not produce educated men. He wants us to adopt a plan of technological education which would include, with every technological speciality, the 'history and philosophy' of the speciality as well as cognate subjects, 'of a more economic, political, physiological, and psychological variety'. This plan, he tells us, would produce technologists 'whose deep understanding of a special discipline, in a broader context of related disciplines, is a certain source of new ideas in the future'. They would, moreover,

be technologists whose education had made them 'like any other well-educated person'.

Mr. Hanson's claim that a 'deep understanding of a special discipline in a broader context of related disciplines' will work as a 'certain' source of new ideas is a claim that he doesn't at all substantiate. One could readily have agreed with him if he had maintained that if students of technology were required to study at first hand the lives, the working records, and especially the notebooks of some of the great innovators in technology — Leonardo da Vinci for example — they might, by a kind of contagion, acquire some of the adventurousness of these innovators and so become more productive of new technological ideas. One could not, however, count upon any such happy result if students were merely given a second-hand account of the results those men achieved. It would only follow in such measure as the teaching was done by men who themselves had adventurousness of mind and who could, by inviting their pupils to join them in thought awaken such adventurousness in them. This is something that it is essential to take into account in devising any plan for the improvement of technological education, and I shall have more to say about it later on. At the moment I am only concerned to protest against Mr. Hanson's assumption that the only thing needed to produce technologists with a greater fecundity of ideas is a mere reform in the syllabus.

Mr. Hanson's further claim that his reformed plan of technological education would produce technologists whose education had made them 'like any other well-educated person' is even more open to question. The well-educated man is one who recognises that technological achievement is but one amongst many forms of achievement, most of which are not scientific at all: these include achievement in art, especially in the art of writing, in law, and in political wisdom. He is, moreover, one who recognises that the achievement which is fundamental to all others is that quite unscientific achievement through which we enter imaginatively into the thought and feeling of others and through which we learn from them and go on to build good and constructive relationships with them. It is through understanding this that he comes to understand how all other achievements are related to one another. It is only through understanding it that he can see science in its proper perspective. No plan of education, which fosters the idea that the presentation of all other achievements should be ancillary to the study of science and technology can possibly produce well-educated men.

The shortcomings of Mr. Hanson's idea of the well-educated man appear very clearly in what he has to say in contrasting the kind of education he advocates with education which he describes as 'narrowly scientific'. This he tells us 'may fail to develop the curiosity, imagination and interest which *constitute* being a well-educated man'. That the encouragement of these virtues is an important part of educational purpose is not for a moment to be denied; their encouragement cannot, however, provide an adequate definition of a good education. This definition by itself would allow us to classify as 'well-educated' the Nazi doctors who experimented on the victims of Belsen, and who were no doubt men of interest, curiosity and even imagination (of a sort). It is true that Mr. Hanson does not hold strictly to his own definition. He speaks of the men educated according to his plan as being 'thoroughly civilised' and as having awareness of human and social considerations. He does not, however, say what constitutes a thoroughly civilised person and his plan of education leaves out of account many of the essential civilised virtues.

For a definition of civilising education to be adequate it must not take mere 'interest' as a criterion; it must have reference to the sorts of things that a man is interested in; it must also have reference to the way in which he comes to understand and to regard them through pursuing his interest. Again, it must refer to what he comes to be as a result of his understanding and of the feelings that are engendered by it. What a good education should be follows from what I have already said about the well-educated man. It must bring with it some understanding of our material environment. This, though its importance is great, is not, however, the essential thing. The essential thing is that it should bring an understanding of people and of human affairs. It should bring with it a recognition that men's lives, though in part the result of environmental influence, are also an expression of their capacity for conceiving of values, for discriminating between values, and for bringing into being the things that are valued. The values with which it is concerned are not only those which animate the search for scientific truth and technological innovation, they are also those that find expression in social living and in the Arts. Primary are those values through which men enter into communion with one another and learn from one another. The reason for their being primary is that all that man achieves in any field of endeavour is made possible by what he has become through having been nurtured and taught by other human beings, and through having lived and worked with them.

The study of human values cannot be of the 'objective' kind that is concerned only with material things, or with the observable facts of human behaviour as it is played upon by environmental circumstance; nor can the knowledge that results from it be the sort of useful possession that may be acquired, as scientific knowledge may be, without the possessor's personal life being affected by it. Just as a man can only know what it is for another to feel hungry by having himself had experiences of hunger, so also can a man only know what it is for another to deliberate on a question of value by analogy with his own experience of deliberating on questions of value. In studying the achievements of others a man is studying the expression of imaginative and discriminatory powers which he himself possesses and which he can know at first hand only in his own exercise of these powers. His capacity for appreciating the attainments of people greater than himself is, of course, limited by the extent of his own attainment. Neither a youngster nor a fool can appreciate the mature achievement of a great man. The youngster may, however, learn from him. The great fact, to which the very possibility of education is due, is that men, through having to do with — and especially through reflecting upon — the achievements of men greater than themselves are able to conceive for themselves the values that are expressed in these achievements. Through this they not only come to understand what they did not understand before, they also enlarge their vision of great achievement and the possibility of emulating it. Thus liberal education is an activity through which people become transformed in a way that does not merely give them a greater understanding of people in some objective sense which leaves them untouched. It is an activity which brings them into fuller communion with others and gives them greater stature as people.

But though the recognition of all this is essential to any definition of a good education, none of it is referred to by Mr. Hanson either in the definition he gives of a good education or in the plan for the education of technologists which he recommends. On the contrary, instead of recognising that achievement in technology is one among many kinds of achievement to which an understanding of other people and of the words they use is fundamental, he regards it as a 'lens' through which the educated technologists should view the world. In adopting this metaphor he overlooks the fact that the lens of science produces only a very distorted image of what human beings are. Through it they appear either as beings in whose lives rational deliberation plays no

part or, at best, as beings whose reason is concerned only with making right scientific inferences and not at all with moral or æsthetic values.

It is true that Mr. Hanson concedes that, besides the lens of scientific specialism, there are other lenses corresponding to other specialisms. What he does not take into account is that it is the eye, and especially the eye of human understanding, that we see with. To understand what we are doing when we achieve anything at all, whether in science or art or in personal living (to say nothing of 'lens making') and thus make greater achievement possible, what we need is not something to be described by the metaphor of a lens but by that age-old metaphor of the mirror which enables us to see our own image and so to reflect upon what we are and what we do. What is of the utmost importance is reflection upon how we constitute our minds with the help of our common possession of language. Unless we understand language, what we do with it, what it does with us, and just how different forms of achievement depend upon it, we cannot count ourselves educated. Every special study provides scope for such reflection and it is mainly through this that a special study can escape being a narrow one. It is language in its relation to thought, to feeling, and to action, that provides the common denominator and unifying bond in all learning. If specialist teachers of technology do not recognise this, and do not foster a recognition of it through their teaching they are withholding from their pupils the main instrument of self-knowledge and giving them no more than enthusiasm, skill, and a box of tricks to conjure with. We may choose to believe that they will have moral judgment, sensibility, and sense, derived from the resources of common humanity. If we choose to believe this we are believing it without evidence, for we have as yet no experience of a society where all the best minds are scientifically educated and see all else through the lens of science.

To criticise the idea that specialisation in science provides a lens with which to achieve greater discernment of humanity is not at all to belittle the educative value which specialisation in science — or in any other subject — may have. The contribution that it may make to a man's education (as opposed to his acquisition of specialised skill) depends, however, upon the degree to which it is accompanied by reflection upon what he is doing in pursuing his specialism and how this differs from, resembles, and is otherwise related to, what he does in his other, non-scientific, activities. In the unqualified claims he makes for the educative value of specialisation Mr. Hanson does not

take this sufficiently into account. He also goes much too far in taking the view that only the specialist can be well-educated. The famous men he quotes as support to his view do not in fact show that specialists alone are cultivated. They show that great men always have specialist work — how should they not, since most men have some special work and the great will be outstanding in it? But it is not only those whose eminence is shown in published works who should be regarded as typifying the 'well-educated man'. It is surely true that many an eminent lawyer or civil servant has been well-educated in a good range of sciences and letters although not a specialist in any of them. There are also well-educated women, some of whom find their way into politics and the professions. We ought also to remember that in the past specialists, including scientific specialists, all received a grounding in the humanities, and especially in the study of language, which gave them the habit of reflection and so prevented their becoming narrow specialists. There is no reason to suppose that technologists who, instead of being schooled in the humane studies that were required of Gibbon and Russell and Bohr, had had humane studies presented to them only as the servants of science, would turn out to be men of as great depth of understanding.

I would go even further and challenge Mr. Hanson to show that the men he quotes arrived at their general cultivation through pursuing philosophy and the like as offshoots of their specialism. Is there any sign that Russell pursued literature, history, and social theory in order to find more illumination in mathematics or logic? Did Hume study history, diplomatic expertise and literature in order to throw light on philosophy? Surely these branches of humane letters were not seen by such men through the lens of specialisation. They were rather the soil which nourished a profounder understanding of their speciality. Do not let us fall into the error of supposing that the soil chemicals are produced by the growth of the plant. A student may learn the philosophy of science for the sake of science, but it will not then be his science that makes him philosophical, but his philosophical study that gives him a better understanding of what he is doing in science and in other things also.

The young need knowledge of themselves and they know they need it. It is no economy of precious educational time to try to insinuate an understanding of humanity into their studies on the pretext that you are adding to their knowledge of some other specialism. It is not good sense to teach men the humanities by persuading them that these

studies are part of science. This is a device for distracting men from what they need by diverting their attention to something that you suppose that they think they need: and if the teacher himself is not fully understanding of the virtue humane study should impart, then the situation is very like that of the man described by Plato in the Phædrus, who is inadvertently persuaded by his friend to take a donkey into battle, through the circumstance that both believed a horse to be that animal which has the longest ears.

This brings me back to Mr. Hanson's question of the possible 'sacrifices' we would have to make to remain a world power in the 'scientific and technological field'. This question needs more explicit attention than he gives it. The first thing we ought not to give up is the devotion of a good proportion of first-class minds to the study of the humanities as their first interest. Without this the humanity of a technological society, and its deeper morality, would surely suffer quite calamitously. These are the people on whom we rely to enrich the resources of the literary tradition from which any living social ethic must draw its sustenance. (I am not referring here only to those students of the humanities who become university and school teachers.) Secondly, we must teach the scientifically specialised part of the nation how to sustain itself from these sources.

How is this second task to be accomplished? Our problem — and many of us would hope and believe that numbers of teachers both in school and university are alive to it — is to educate all citizens and especially those able young people who are going into professional work to *know what they are about*. Technologists need an education which from the earliest days of their schooling helps them discover what they are about as citizens, as devotees of this or that art, and as adherents to this or that belief. We want men and women of good will as well as of interest and curiosity, but we want good will informed by understanding no less than we want curiosity informed by it. This is a development which if not well-started in school may never get very far. If one thing is certain in the twentieth century it is that we need a perceptiveness of personal and political issues that is at once rational, sensitive and humane. Without this all the enthusiasm, interest, energy, which Mr. Hanson so rightly desires, may lead as easily into bad or foolish ventures as towards a more prosperous and moral society. I am not denying the importance of developing a scientific habit of mind through education. Many past mistakes in political and social policies may well have been largely due to a lack

of it. But in all this we have something still to learn from Plato who, advocate of mathematical education as he was, insisted that you must not try to educate people through science unless, by the literary education of sensibility and moral judgment, you have first 'formed a constitution in them'. We need to foster humanity and we already have good reason to note the dangers of defining intellectual achievement in such a way that its main task seems to be the perfection of technical instruments. Once this is done people are only too prone to take the view that the rest of life (except in so far as it is amenable to scientific experiment) is not a matter of earnest intellectual effort but is decided by some sort of innate common sense, or by the accidents of personal preference. Here I am not at all forgetting that our scientists' communities are composed of humane, thoughtful persons. It is, however, important to ask whether they are likely to remain so unless we are careful about the sort of educational change we aim at in a society in which we are to have an increasingly higher proportion of scientists.

Translating this into terms of curriculum (although, as I shall be saying, it is the *kind* and *quality* of the actual teaching that is most important), it means that we should have our humane studies for technologists — and for others too — standing in their own right and not as adjuncts to something else. In school, some such studies should be carried right through to the end of the school years, for those who are to specialise in science as well as for others. I shall have something to say in a moment about the sort of purpose, in general, such teaching should have if it is to achieve the all-important things with economy of time. Here I would emphasise that although similar purposes may — indeed should — enter into the teaching of science itself, it is in principle impossible for science teaching to achieve many of the important purposes of the study of the humanities, which must therefore continue to have place in their own right. When it comes to the University, there should still be *some* humane study included in the scientist's work, especially when, as in Scotland, students arrive at the University relatively young. We might waive such a requirement as soon as we find men and women in departments of science and technology showing themselves men and women of such cultivation that the development of it can safely be left to their own initiative.

The technological society must be grounded in the humanities and this is something that the teacher of technology should very clearly understand. It is important that his understanding should be that of a person who has actually attained the virtues that humane studies

have to impart, not one who has had a secondhand account of these. He must have undertaken studies through which he has become possessor of these virtues, and he must have learnt how to foster them in his pupils. We must insist that a teacher of technology should be a person who has carried his humane studies a good deal further than is possible for those who become technological practitioners rather than teachers. Mr. Hanson does not tell us how the teacher is to help in fostering even the particular virtues of curiosity, interest, and imagination by which he defines a good education. He insists that, at the University, students must cease to follow the path of obedience (which he suggests is appropriate while people are still at school) and must learn to become 'navigators' in learning. He does not however give us an answer to the question that is of paramount importance if we are to foster adventurous minded technologists: how to teach them the art of navigation. His main suggestion is that it is an art that people learn by being 'cut adrift'. He tells us that when cut adrift only some students discover the art of navigation, but he makes no suggestion that any student's failure to discover the art might be due to failure on the teacher's part. In speaking of students 'who think the genial advice of their tutors and supervisors to be just like the reprimands of their schoolmasters' he is all too ready to blame the students when he should have been asking how it is that giving 'genial advice' does not always prove very successful and what else, especially in the way of questioning, may be necessary. He also casts a quite undeserved slur on the work of good schoolmasters, many of whom do excellently (especially in their Sixth Form work) in teaching their pupils the art of discovering things for themselves. He has not recognised that most of the students at the University who show good power of navigation are those who were well launched in the art by their schoolmasters. Nor does he recognise that those who at school learned only obedience in learning have more to unlearn when they get to the University than many are ever helped to do.

In using the metaphor of 'navigation', Mr. Hanson is mainly speaking of the abilities which result in successful research in science and technology. The development of these he regards as the primary purpose of the University. 'The entire conception of the University' he tells us 'rests on offering young men and women the opportunity for developing traits that are necessary for independent research.' In saying this he is taking one of the University's purposes as its whole purpose. What he leaves out of account in the purpose of the Univer-

sity (and it is a prior purpose) to help students enter, largely through reading, into one or more traditions of understanding whereby various dimensions of the world (corresponding with the various 'subjects') become intelligible. Through the study of scientific texts, reinforced by lectures, demonstrations, and laboratory work, the universities aim at fostering an understanding of the material world. Through humane studies in literature, history, philosophy, and the like they aim at fostering an understanding of the world of human affairs and especially of human values. It is, of course, of the highest importance that the University should foster the powers which lead to an acquisition of new knowledge both in science and the humanities. It must not however be forgotten that achievement in this depends upon the acquisition of understanding — understanding which is at one and the same time an understanding of what is said in texts of various sorts — scientific and otherwise — and an understanding of what the text is about. The education we want must show how an understanding of things has its origin in the imagination and how the imagination through which we understand things is awakened by, and so secondary to, the imagination through which we come to understand, and to share a common life with, other people. The studies by which such understanding is to be increased are outstandingly the studies of literature, history and philosophy. For these studies to exercise their educative power the student must learn to use them as an aid to reflection upon his own capacity as a human being. It is through this alone that he can come to understand and to emulate the achievements of others whether in science or in anything else. It is however an unjustified belief that study of these subjects will inevitably, by some unexplained magic, result in the student becoming a more educated person. Such magic, of course, is not entirely non-existent. Great works of literature and philosophy are themselves teachers of self-knowledge. Their value, however, is something that may either be greatly increased, or reduced almost to zero, by the way they are taught.

The teaching that is needed is the kind that will give students the power of interpreting the texts they study, and of comprehending what sort of an activity they are entering into in each of their studies and how these differ from one another. If we could teach all students to read in this sense we should have done a good deal to further their education: unless we can teach our technologists to do it we shall not

be doing what we should towards making them either good technologists or educated citizens.

If we are to produce technologists who are educated men we must look not only to what can be done in the universities but also to what can and should be done in the schools. If young people's schooling be effectively liberal it will have given them some experience of what it is to augment their knowledge of themselves and the excitement that goes with it. Specialisation contributes to this end if the specialisation is begun in the way a good sixth form teacher seeks to do it. What is to-day working to prevent the schools from teaching their pupils the art of independent study is the ever earlier, and ever more intense, unreflective specialisation which is required of them. This transforms what should be humanising studies into the learning of subject matter and forces increasingly the adoption of cramming methods. A large part of the blame for this anti-educational development lies with the universities, all too many of whose members share Mr. Hanson's opinion that the school is the place where you obediently learn the facts, and that you only begin to think about them when you get to a university. Until the universities recognise the mischievousness of this view and adopt entrance requirements that give the schools a great deal more enlightened help than they now give in laying the foundations of their pupils' liberal education, no endeavour of theirs to produce technologists who are 'like any other well educated person' is likely to have any great success.

3. A COURSE IN THE LIBERAL ARTS

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I FIND myself so much in agreement with Professor Pilley in the general direction and emphasis of his comments on Mr. Hanson's article that what I have to say will probably be little more than a re-statement of his main points. But since the topic is of such vital importance, and since Mr. Hanson's views, though for the most part (as I shall want to argue) wide of the mark, nevertheless genuinely challenge the Arts specialist to set out explicitly his own views on the nature of a liberal education and the grounds of his belief in the irreplaceable value of such an education—for these reasons it would seem worth re-stating the position that Professor Pilley has already admirably set out, with such differences in emphasis and additions of detail as may advance the discussion a further stage. The chief addition I hope to make concerns what may be called practical recommendations: how the thing might conceivably be done if it were demonstrably worth doing; how, specifically, in the conditions of British schools and British universities, the science specialist might be put in possession of that which, by general consent, his scientific education does not provide—if, again, it can be shown that this is worth possessing.

Professor Pilley has, I think, made it sufficiently clear that what Mr. Hanson proposes for the liberal education of scientists will, distinctly, not do. It will not do for this principal reason, that it will indeed make *a more educated* scientist but leave him still *a scientist*. The limiting effects of an exclusively scientific education go deeper than any that can be remedied by Mr. Hanson's plan; and nothing is gained by pretending that the distinctive values of a traditional liberal education can be achieved without moving a step outside of the sphere of science. In speaking in this way about the 'limitations' of science, I hope I need hardly insist that there is no intention of casting any slur upon science or the practising scientist. The 'limitations' of science (as everyone knows) are the necessary condition of the scientific enterprise itself, the only condition upon which that form of creative energy can be exercised at all, and the end of science, 'to extend more widely the limits of the power and greatness of man' (as Francis Bacon put it), accomplished. The value of the scientific

enterprise and the scientific achievement is, in this discussion, assumed, and does not therefore have to be argued. What has to be argued is only the incompleteness of a scientific *education* for the end of producing what the older moralists and educationists called a Whole Man, and (even more) the possible ways in which its unavoidable defects may be remedied.

It is clear that our difference, Professor Pilley's and mine, with Mr. Hanson turns upon quite fundamental matters: first, upon the very 'idea' of a university, second, upon the definition of a liberal education. Concerning the first, I will not attempt an explicit definition, though I hope some sort of a definition will in fact be implicit in what I do want to say explicitly about the 'idea' of a liberal education. All I want to say under this head is by way of correction of what I believe to be a seriously misleading notion of Mr. Hanson's, that the '*primary* intention' of a university (Mr. Hanson's phrase) is to advance research: '[to offer] to young men and women the opportunity to develop traits needed for carrying on independent research'. Now, this may be true of the 'primary intention' of the science faculties of a university; and then it already becomes a question whether it is a university we are talking about or only an institute of technology (like M.I.T. or the Technion at Haifa). But, still leaving aside questions of definition, what is certain is that this is not, and never has been, the primary intention of any *university* that *is* a university and not an institute of technology. The rubrics of Cambridge University, for instance, speak of the university as 'a place of education, learning and research', and new scholars and fellows of many Cambridge colleges are required at their Solemn Admission to subscribe to this definition of the 'intention' of their university. The order is significant: first, 'education', whatever that may be; next, 'learning', whatever *that* may be; and only last 'research', which Mr. Hanson has defined.

And this statement of intention is confirmed by the empirical evidences. The overwhelming majority of graduates of any university, taking the science and the arts faculties together, do not in fact proceed to 'research'. The majority do not, ever, make any recognisable contribution to knowledge in their special field: they do not become distinguished, or even mediocre, historians or philosophers or literary critics or classical scholars; they do not, in short, use what they have learnt in their three years at the university in that way at all. And unless they have completely wasted their time (and nowa-

days also much of the nation's money), it must be supposed that the education they have received at the university has given them something quite different from anything that Mr. Hanson would appear to have any vivid conception of.

What they have received — or what at least they have been offered — is what may still be called a liberal education. This (as Professor Pilley has intimated) consists essentially in the enlargement of the mind and the refinement of the sensibilities in such a way as to put the recipient in possession of resources for life that a purely scientific education cannot, by its nature, yield. The emphasis is upon *life*, resources *for life*. Not, in the first instance, for 'research', 'independent discovery' and so on — though the advancement of learning may indeed be one of the good results of such an education. Nor, on the other side, for mere good conversation — 'the art of living', as the modern dilettanti still like to call it: which reduces a liberal education to a superior sort of social accomplishment, and, as such, would earn the opprobrium in which Mr. Hanson justly holds it. Good conversation and other civilised habits will, again, no doubt be among the good results of such an education, but it is not the end to which it is directed.

The end (it is suggested) is the enlargement of the mind and the refinement of the sensibilities — pre-eminently, the moral and æsthetic sensibilities — so as to yield the maximum resources for life. By being exposed as directly as possible to the productions of those, the great poets and philosophers, who have themselves been most fully exposed to life, the student receives an insight into the sheer range and variety of possible human experience that his own necessarily limited life's experience could never yield. And because what he receives of the wisdom of life from the poets and philosophers is not only various and intense, but also orderly and coherent — a *vision* of life, we call it for that reason — his exposure to their works yields also that precious intelligibility, that genuine illumination of life, without which mere variety and intensity are of limited value, if not positively harmful.

So, speaking generally, it is life at its most various, most intense and most illuminating that the student is exposed to in his pursuit of the liberal studies. And this, it will be clear, is not primarily a matter of acquiring 'knowledge' — knowledge in the sense of information. No one can know everything, Mr. Hanson rightly says; and so it is not a matter of the number of books, authors, historical periods, philosophical doctrines and so on that the student 'knows' and can talk

about in an informed way. It is a matter rather of insight, of wisdom, of discrimination, of appreciation: of being accessible to life at as many points as possible: of using one's full potentialities as a human being: of possessing the resources for continual growth and development *as* a human being long after one has left the university: of having acquired certain *habits* — settled and enduring habits — of enjoyment and appreciation.

Indeed, the emphasis must, I believe, in the end fall upon the *enjoyment*. For it is that which gives the educated man his deepest and most lasting enjoyment that defines his character as an educated man. To put it simply and directly: the educated man is he to whom the habitual (though not necessarily exclusive) reading and discussion of serious literature and listening to serious music and looking at pictures and buildings are as necessary to his happiness as decent living conditions, the right job, the right wife, children, friends and so on. It is a matter, in short, of the *quality* of the life for which his studies at the university have been a 'preparation' (as the educationists say it ought to be); and the man who has been 'prepared' by his education to live the kind of life of which the activities mentioned are an indispensable part is a properly educated man. He need not be more — he need not be capable of 'research' and 'independent discovery'; but he cannot be much less and be an educated man in any proper sense of the word.

From what has been said it is evident that the only studies that can produce this sort of Whole Man are the traditional 'arts' studies, namely, literature, philosophy and history, supplemented by music, painting and architecture. This is a point that Professor Pilley made in his article, and I would like to reiterate it with emphasis. For the reason that literature touches life in its intimate human aspects at so many more points, and renders it so much more directly and concretely, than either philosophy or history, it would seem to have a claim to be regarded as the fundamental study. Philosophy and history would then rank as 'major' auxiliary studies, and music, painting and architecture (for reasons to be mentioned later) as 'minor' auxiliaries. But though the relative value for the ends of a liberal education of the studies I have mentioned may be arguable, what is certain is that these and no others constitute the basis of such an education. The quasi-scientific studies, such as economics, sociology, anthropology, archæology, philology and (even) psychology must, on this principle, be excluded; and classics and modern and medieval languages, the

remaining major studies in the normal Arts curriculum, will be subsumed under literature, philosophy and history in so far as they are literary, philosophical and historical, and excluded as quasi-scientific in so far as they are purely linguistic and philological.

So it would seem that, if the business of humanising the specialist is taken seriously, one is inescapably committed to providing, in the Sixth Form at school and at the university, a course of study centring in the traditional 'liberal arts' subjects. And if this is accepted as inescapable, the problem immediately becomes purely educational. What, precisely, shall he be taught? How, in view of his special needs and interests (and qualifications and disqualifications), is he to be taught whatever it is thought best to teach him? And: how is all this humanising study to be accommodated within the notoriously crowded curriculum of the science specialist?

This brings me straight to my practical recommendations; and partly for economy's sake, but chiefly (as I have already mentioned) because I believe it to be the fundamental study, I will confine myself by way of example to the course in literature. And in case it should be feared that the scheme I want to propose would consume a prohibitive amount of the time needed for the science specialist's scientific studies, I should like to say right away that I have in mind nothing more ambitious than two, or at most three, hours a week to be set aside for this purpose throughout the normal five-year period of Sixth Form and university degree course. No doubt even two hours a week will seem too much to those who do not take seriously the need for these liberalising studies. But I am addressing myself to those who do, or at least are prepared to, take it seriously; and to those, two or three hours a week will not, I hope, seem excessive.

What follows is a schematic account of what I take to be the principal constituent parts of a course of literary studies for science specialists, with some indication of the way in which each may be supposed to satisfy the main requirements of a liberal education.

(1) Overwhelmingly the principal part of the course is that which aims at giving the scientist the most direct access possible to some of the great representative works of some of the great representative minds in the European literary tradition. It is, unashamedly, the wisdom of life we are after; and the only way to come by this wisdom is by the most direct contact with the works of those who have in fact possessed it in a superlative degree. And so, unashamedly again, we commit ourselves to a system of 'set books' — the intensive study, that

is, of specific works of literature (novels, dramas, poems), supplemented by specific works of philosophy and history. This, I believe, is the only way to ensure that directness of exposure to the great sustaining minds in our cultural tradition by which the scientist is to receive his training of the moral and æsthetic sensibilities.

Everything, it need hardly be said, will depend upon the choice of set books and upon the way they are taught. Concerning first the choice: there is for us, of course, no question of Mr. Mortimer Adler's 'Hundred Great Books,' or the elaborate apparatus of enquiry brought to bear upon these at Chicago: we shall be content, from choice as well as necessity, with something much more modest. But the principle of the 'great' book must in general, I think, be adopted, since only a 'great' book can be representative in the way required, and can repay the kind of intensive study we are recommending as the best way to achieve the training of sensibility we are aiming at. So the 'set books' are to be exclusively, or almost exclusively, 'great' works: combining, that is, the greatest possible comprehensiveness with the greatest possible coherence: being comprehensive in the sense of having most to offer in range and depth and intensity of significant life's experience, and coherent in the sense of being greatly achieved as works of art. The kind of novel I have in mind is of the order of *Middlemarch, The Portrait of a Lady, Anna Karenina,* the kind of drama *Oedipus Rex* and *King Lear,* the kind of poetry *The Canterbury Tales,* Shakespeare's Sonnets, Dryden's *Absalom and Achitophel,* T. S. Eliot's *Four Quartets.* And in the rank of the distinguished rather than the 'great', one might add, for instance, E. M. Forster's *A Passage to India,* some of Conrad's stories and some of D. H. Lawrence's, some of Pope's satirical poetry and some of Wordsworth's and Keats's poetry, a selection of Ibsen's and Chekov's plays, and perhaps Marlowe's *Doctor Faustus* and Webster's *Duchess of Malfi.* There are, of course, plenty of other great and distinguished works in the English and European literary traditions; and I offer these only as a representative selection of the kind of literary work that I have reason to believe, from my own experience of teaching non-literary adults (including scientists), could be made rewarding and delightful to the specialist scientist.

A point that ought perhaps to be re-emphasised at this point is that the *number* of books read is of no account whatever. It is distinctly quality we are after, not quantity. 'We sow the germs of aftergrowth', said Coleridge, in a similar connection and with the nicest applicability to the university teacher's task. What matters is never the number of

books the student has read by the time he goes down from the university, but how he has read what he has read — with what closeness and seriousness of attention, with what insight, with what enjoyment. The germs of aftergrowth are most securely sown for the student who has come to understand, in a really complete and really intimate way, the kind of moral and æsthetic achievement represented by (say) *King Lear,* or the Lydgate-Rosamond Vincey story in *Middlemarch,* or any one of the *Four Quartets*; and even if he has read nothing more than this in all his three years at the university (though one hopes, of course, that he will in fact have read more), he will still have come away with more of lasting value for his development as a human being than the man who has read more widely and more perfunctorily. For to understand in this way (for instance) the tragedy of *King Lear* is to receive a profound and lasting impression of the destructive power of evil when it takes the form of the negation of love (figured chiefly in the cold hearts of the pelican daughters, but also in the imperious pride of the father), and an impression, as profound and lasting, of the redeeming power of love and loyalty, figured in Cordelia and Kent. Or, again: to understand the story of Lydgate and Rosamond in *Middlemarch* is to receive the kind of insight into the subtler dangers and disasters to which that most delicate of human relations, the marriage relation, is by its nature exposed that can hardly fail to be profoundly illuminating to a young man. And the same is true of Mr. Eliot's *Four Quartets*: to follow out the 'argument' of *Burnt Norton* or *East Coker* is to be exposed to a poetic analysis of the spiritual condition of modern man so searching and so powerful that, again, it cannot fail to be illuminating — in particular, in this instance, of the religious view of life, which it is essential that the young man should understand whether he himself adopts or rejects that view.

This is the kind of value for his development as a human being that a serious study of even a few really great works of literature may be expected to yield to the science student. In stressing few rather than many, I am of course invoking an educational principle that is as old as it is well attested. But since it is still so much more honoured in the breach than the observance — and in particular by the arts people themselves, who tend often to over-value mere extensiveness of reading ('being well-read', as they call it) and to under-value thoroughness and depth in the reading of what is read — that it seems worth re-stating with emphasis in the present connection.

And now (still confining myself to the literature course) concerning the method of teaching. The kind of help that the non-literary student of literature needs is, I believe, substantially the same as the literary student's. He needs, first and principally, help in the interpretation of the text — in understanding, that is, *what* has been said; and this, in any piece of literature that has been properly achieved as literature, is inseparable from the 'style', or *how* what is said has been said. And he needs help also in the appraisal of the work before him, in making a judgment of its quality; and this, though in analysis distinct from the activity of interpretation (as 'content' and 'form', what is said and how it is said, are not distinct), is in practice barely separable from it. We do not *first* 'understand', *then* 'judge': we judge *as* we understand; and the more practised the reader, the more simultaneous, the less successive, his understanding and his judging tend to become.

The most important practical point in the method of teaching the science specialist is that it shall ensure the student's active participation in the business of interpretation and appraisal. This means that the teaching ought to be based on discussion rather than lectures (roughly on the lines followed by the W.E.A., that is, one hour's lecturing, one hour's discussion); and, if the seminar principle is observed, the student will have a chance also to write on topics bearing on the set texts. How much detailed discussion of the student's own efforts can be fitted in will depend, of course, on the size of the classes, and this, in turn, on the number of teachers. But it is, I believe, very important that the student should write regularly, partly for the practice in the writing itself (which, it is generally agreed, science specialists are particularly in need of, since their own subjects often do not give enough opportunity for practice in the art of 'composition'), but chiefly because this is the best way of coming to grips with his text and seeing for himself what he can make of it unaided. The teacher's help in lectures and discussions will have a greatly enhanced value for him when he has really felt the need of such help.

It will often be necessary to supply whatever 'background' information may be needed for the proper understanding of what the work is about. Taking *King Lear* as an instance: the student with no literary background will probably need to be told something about the theatre and the audiences for which Shakespeare wrote, and perhaps shown how the effects of these conditions are to be discerned specifically in *King Lear*. But chiefly he will need to know something about the

principal conventions of the Elizabethan-Jacobean poetic drama as a whole, in order that he may understand (among other things) how drama of the order of *King Lear* can be achieved within the framework of a 'plot' so seemingly primitive and melodramatic; and, in explaining this, the teacher will in addition have an opportunity to remove any disabling preconceptions about the drama that the student may have formed from his experience of the modern 'naturalistic' drama alone. Or, if the work studied happens to be *Emma* or *Middlemarch,* he will need to be told something about the society, or rather, the social order, that Jane Austen and George Eliot chose to exhibit in their novels — something, for instance, about the social and economic structure of that society, and the connexion between this and the assumptions about life — the values, the ideals — that are the raw material of the novelist's 'criticism of life'.

This, however, the supplying of more or less elementary 'background' knowledge, is a relatively simple part of the literature teacher's task. What is less simple is, somehow, to supply the very experience of life which the young student is unlikely to possess, yet without which he may be more or less totally disabled for receiving what the work has to offer him. This is one of the most difficult and delicate parts of the literature teacher's task. For it has to be accomplished unobtrusively: there can be no question of giving them moral instruction in the abstract (this may indeed be what they need, but the literature teacher is not a moralist or a preacher); and one prefers also to avoid making direct appeals to their personal experience — what one aims at rather is so to expound the text that they will make the vital personal application for themselves. Yet it has somehow to be done, and done authoritatively, with the authority of true knowledge, since only a true knowledge of life will make the text intelligible.

The kind of knowledge I have in mind is sometimes quite elementary, sometimes more complex. It can be as elementary as the matter of the 'ingratitude' of Lear's daughters. I have met in adult readers of *King Lear* (one was a research scientist, thoroughly serious-minded and otherwise very intelligent) a more or less total incapacity to understand the anguish of spirit induced in Lear by the 'ingratitude' of his daughters—or, at least, an anguish so intense as to end in madness; and since they could not *feel,* immediately and intimately, the moral repulsiveness of the daughters' conduct (leaving aside the larger outrage, the violation of the universal order, that their 'hard hearts' are also meant to represent), it is not surprising that they should

find Lear's anguish 'exaggerated'. Given this sort of gap in the student's elementary moral experience, there would seem to be no alternative but to supply it — by (one must suppose) so interweaving exposition with commentary in the elucidation of the moral theme that the missing sense of the moral horror is, as it were, *created*.

Listen to Regan's *voice* here (one might say to them at Act II, Scene 4):

Lear: I gave you all.
Regan: And in good time you gave it.
Lear: Made you my guardians, my depositaries;
. . . What, must I come to you
With five and twenty? Regan, said you so?
Regan: And speak't again, my Lord: no more with me. . . .
Lear: Those wicked creatures yet do look well-favoured
When others are more wicked. . . .

Do you *hear* the appalling callousness in the tone of her voice? — the easy, casual, insensate way in which she can dismiss the wishes of her father the king as the foolish fancy of a senile old man. Can you *see* how it sears Lear's heart, burns into his brain — strikes him blind with anguish and rage? Anguish for himself — his humiliation and helplessness; and self-loathing — that he should have been so deceived: how could he, oh how could he, ever think she loved him? And rage, black bitter rage, at her impudence and callousness — so impudent *because* so callous; and horror, a sort of stricken incredulous horror, at the universal implications of such callousness: 'Is there any cause in nature that makes these hard hearts?' That way indeed madness lies for a man so abused when he is man of Lear's temper. He raves about it continually in his madness: 'What! have his daughters brought him to this pass?' . . . And so on.

A rather more complex instance of the same sort of problem might occur in a discussion of *The Turn of the Screw*, where the problem might be (for instance) to explain the nature of the mysterious relation between the children and the dead servants — which James himself (as the students will know) deliberately leaves unexplained. Here one would have so to reconstruct the moral and psychological situation as to bring home to them the effect upon two very intelligent, very precocious, very impressionable children of being exposed to a really evil adult influence in their immediate environment. Perhaps thus:

Imagine, first, such a child as little Maisie Farange, in that other famous story about the attempted corruption of a young child, *What Maisie Knew* — imagine such a child as Maisie exposed to the ugly violence of parents bitterly hostile to one another, who use the child as a means to pay off their sordid scores against one another. In this story the child survives, triumphantly — chiefly because she is not left completely unprotected but has her old nurse Mrs. Wix to stand between her and the two sets of parents. But: imagine now (and this is what James asks us to imagine in *The Turn of the Screw*) — imagine the same type of child exposed with no protection at all — and exposed here to the insinuating advances of a man-servant and a governess. The man (we are to suppose) is openly and coarsely degenerate, the governess more genteel ('She

was a lady', we are told); and the man has also a touch of a certain flamboyancy that a small boy might find especially attractive. Both are degenerate: steeped in all the cheapness and shoddiness and shabbiness of the half-educated mind — thoroughly meretricious, in short; and both are unmistakably seeking some sort of erotic satisfaction in their relations with the children. Imagine, now, the character and development of this relation. The servants, with no master or mistress to check them, are free to talk to the children, as often and as long as they like, in the discursive, confidential, insinuating way of servants. They are free to tell them 'things about life' — the sorts of 'things about life' that no child should ever be told because it has not the resources to meet them in an adult way. So they are free to excite the children's imaginations in the most dangerous way, and free to confuse their minds, which are still helpless to distinguish between the genuine and the fake. They are free, in short, to infect the children with their own depraved view of life, and their own depraved taste for the illicit, particularly the erotically stimulating. And presently they are free also to incite them to 'do' things — the sorts of things, whatever they were, for which little Miles was expelled from his school; and in the end, by these various means, they are able to possess themselves wholly of the hearts and minds of the children, attaching them, inseparably, to their own depraved persons.

Now, it is all this that James is asking us to imagine in *The Turn of the Screw*. . . . And so on.

The method, it will be clear, is always to draw upon what is actually there to *be* drawn upon, namely, the student's 'raw' experience of life: which is 'raw' in being fragmentary, half-conscious, unanalysed, un-articulated (and therefore, not properly possessed), but, *being* there, can be 'refined' — by being made, precisely, conscious and analytical and articulate; and made so, not in the abstract, but with direct reference to the concrete situation in the work of literature that is being elucidated. This is what the teacher of literature aims at in this most difficult part of his task; and to succeed in this is at once to put the student in possession of the knowledge of life required for the understanding of the text before him and to enlarge his understanding of life itself in the interests of his development as a human being.

What remains to be said under this head is very obvious, yet perhaps the most important of all. Above everything, the teacher's task is to exhibit what is there to be exhibited in the great works he is discussing in the most interesting, the most vivid, the most absorbing way. Make them *want* to read the book, or re-read it, or read more like it. Make this kind of contact with the great poets and novelists and dramatists a necessity in their lives because an indispensable source of pleasure to them. Make them like and *therefore* need what the Chaucers and the Shakespeares and George Eliots and Henry Jameses have to offer them — and they themselves will see to it that they are never for long without that which they so like and so

need. This most particularly is what is meant by sowing the germs of after-growth; and this, I believe, is neither beyond the capacity of the arts teacher who really knows his job to give, nor beyond the capacity of the science student who really wants to be 'educated' to receive.

(2) I have lingered over this first part of the proposed course of literary studies for science students because (as I explained) I conceive it to be the basis of the whole course. But there are other parts, which though not, in my view, so indispensably necessary (having in mind always the limited amount of time available to us for our humanising business), would nevertheless be very desirable to have; and these can be discussed more briefly.

The first is intended to fulfil another important object of a liberal education. This is to give the student some idea of the cultural tradition in which the great minds have been nurtured and to whose development they in turn have made the greatest contribution. This part of a liberal education must be, in some cases, historical, and it can, of course, easily degenerate into what Mr. Hanson justly despises, the dry-as-dust 'survey' course, which is a mere collection of names and dates, embellished with perfunctory (and usually rather stale and second-hand) tables of 'trends' and 'characteristics" — the main 'trends' of this or that historical period, the main 'characteristics' of this or that literary period or philosophical school or author or group of authors. But it need not be this sort of thing at all if the aim is what it should be, namely, to exhibit *continuity* in the midst of change: to show all that is continuous and persistent in the central cultural tradition, the great changes as mediated by smaller changes, the old persisting in the new, the new continuous with the old. And this is not in the least to diminish from the radical and (even) spectacular character of the great changes, but only to present them in their proper historical perspective: in other words, to define concretely the meaning of the very word 'tradition'. And the more closely this study of the cultural tradition is supplemented and reinforced by intensive work on individual authors and individual works — what I was speaking about in the previous section as the direct exposure to the great sustaining minds that make the tradition worth studying at all — the less likely is it to degenerate into the useless kind of 'survey'.

If a third hour a week could be insinuated into our timetable, this improved 'survey' course would ideally form part of the university course, at least in the first and second years. But if the time cannot

be found at the university, it might be done in the Sixth Form at school: not indeed at quite so advanced a level as at the university, but perhaps satisfactorily enough not at least to leave a complete blank in the way of a general knowledge of the cultural tradition.

(3) A further and final object of a course of liberal studies for the science specialist, as I conceive it, is to give him an insight, as direct and first-hand as possible, into disciplines of thought other than the scientific. This is intended for the enlargement specifically of his intellectual experience, as distinct from (in so far as the distinction can properly be made) the development of his æsthetic and moral sensibilities. And, again, the emphasis is to be on the directness, the immediacy, of the contact. The scientist is to be given the most direct access to (for instance) the discipline of literary criticism; and this means that there is to be no watering down and no 'talking down to the scientist', but — barring the necessary minimum of simplification and additional explanation already referred to — the thing to be presented, as nearly as possible 'from the inside', as the practitioners themselves practise it.

This, again, will be principally accomplished through the discussion of the specific works of literature which forms the basis of the whole course: for (as every scientist knows) there is no better way of exhibiting the principles and procedures of a particular discipline than by showing them *in use*. But there is a strong case, I believe, particularly in instruction intended for the scientist, for making these principles and procedures explicit: for indicating explicitly (for instance) the particular kind of question or questions that each of these disciplines seeks to answer, and the particular kind of answer or answers that satisfies its requirements; and, from there, passing on to such larger matters as the assumptions or 'postulates' upon which the whole study depends, and the 'criteria of verification' that it habitually employs. This sort of philosophical or quasi-philosophical discussion would, I believe, be particularly interesting to scientists, who, by virtue of their training in scientific method, are generally quicker than the average, or even the good, Arts man to grasp the 'logic' of a mode of thought other than their own. And if a special point could be made of bringing out, as far as that is possible, the ways in which the 'logic' of (for instance) the discipline of literary criticism resembles and differs from the logic of science, this part of the proposed course of studies might be of genuine philosophical value to the scientist — to say nothing of its value to the Arts teacher! And since (finally) it could without

undue strain be made part of the study of the individual texts, there is no need this time for anxiety about the extra hour a week.

What I have suggested for the course in literature can, I believe, be applied *mutatis mutandis* to at least one of the 'major' auxiliary studies, namely, philosophy. In designing a course in philosophy for scientists, it would probably be wise, having in mind the 'humanising' object of the whole enterprise, to put the emphasis upon moral and political philosophy rather than logic, epistemology and metaphysics, except in so far as the moral or political system to be studied cannot be understood without some knowledge of its logical, epistemological and metaphysical foundations. Some 'set books' corresponding in magnitude to those suggested for the course in literature would be Plato's *Republic,* Aristotle's *Ethics* and *Politics,* St. Augustine's *The City of God,* Hobbes's *Leviathan*; and any two or three of these, studied in the intensive way suggested for the literary works, and supplemented perhaps by one or two good histories of philosophy, could go a longer way than might be supposed towards stimulating (or satisfying) a taste for philosophical ideas and philosophical speculation. And the same may be supposed to apply also to historical study conducted on these lines. An intensive study of selected 'great' historical works (mixing, as far as possible, the most 'universal' historians with the most intensely 'national' or even parochial — Thucydides and Toynbee, say, and Clarendon and Macaulay) may be expected to yield the required insight into historical thinking as well as a general 'humanising' effect of peculiar value.

As for what I have called the 'minor' auxiliaries, music, painting and architecture: the reason for regarding them as 'minor' (and I have had this view confirmed by experts in the fields of music and architecture at least) is that for at least some of the 'humanising' purposes outlined above — for instance, the development, specifically, of *moral* sensibility and the direct access to disciplines of *thought* other than the scientific — neither music nor painting nor architecture is as immediately and directly instructive as literature supplemented by philosophy and history. For the development of æsthetic sensibility of the non-verbal kind, on the other hand, and for a knowledge of the cultural tradition, painting and architecture are, of course, superb; and the scientists' needs on this side would no doubt be more than satisfied by some such course of lectures on art and architecture as that which Professor Pevsner used to give for many years at Cambridge to huge audiences, including a large proportion of

scientists. Lecturers of the calibre of Professor Pevsner are not indeed to be had for the wanting; but one cannot doubt that the Faculties of Music, Art and Architecture in any university in this country could provide courses for scientists that would sufficiently meet their needs.

The course of liberal studies I have proposed, if taken seriously, would of course leave various practical problems still to be solved: for instance, how much of the course, if any, should be made 'compulsory', how much left optional; and the whole unpalatable question of examinations. These, however, would no doubt be solved easily enough, and need not be pursued in detail here. Concerning the first, my own view is that literature, being (for the reasons mentioned earlier) the fundamental liberalising study, should be made compulsory, whatever else is left optional; and an ideal course, as I envisage it, would consist of three years of literature, following on the two years in the Sixth Form at school, along with two years of either philosophy or history and one year of art and architecture or music. As to examinations: since everyone agrees that examinations are an evil to be avoided wherever possible, it might be a good plan to start with no examinations and see how it works. If it works as it should, no one will think of introducing examinations; if it does not work, examinations will perhaps have to be tried.

In all that has been said about ends and means, the original spring of this whole discussion about humanising the specialist has been rather lost sight of. Mr. Hanson speaks at the opening of his article about the national need for more scientists; and I want very briefly and very tentatively to take up this vital point. Assuming that the need is not to be questioned nor the importance for national survival of meeting it, one would not, I think, be committing oneself to any distasteful 'direction of labour' policy if one took seriously the implied suggestion that a certain proportion of prospective arts students should be encouraged to become scientists instead. Nor would I think myself guilty of any sort of *trahison de clercs* to my own subject (which I think the noblest in the world) if I said what is generally known, and often bitterly commented upon, by university teachers of Arts subjects, namely, that a substantial proportion of their students — probably not less than a quarter everywhere, and possibly as many as a third in some universities — have only a general inclination towards, but no special gift for, the subject they are reading. And when the subject happens to be English, it is still not uncommon to find it being read

as a 'soft option' to a science or to some supposedly more strenuous arts subject, like history or classics.

Confining myself to English as the representative arts subject, I believe it is generally true to say that these students who are reading English as a 'soft option' are not necessarily stupid or lazy — the sort of people, as the phrase goes, who ought not to be at a university at all. This, at any rate, is the case at Cambridge, and one must suppose that it is much the same at other universities. With a few rare exceptions, they are generally quite intelligent and quite hard-working; and what has happened is merely that they have drifted into English because 'they didn't know what else they could do', and, having been 'fairly good' at English at school, thought this, not unnaturally, an easy way of securing a degree. Then, when they find (as they do at Cambridge) that English at the university level is rather more exacting than they had been led to suppose, in the sense of demanding much more of a special gift for the thing than had been thought necessary, they tend to become more or less lost souls: unable almost from the start to cope with the reading; by the third year, as the going gets more difficult, unable even to follow the lectures they are still hopefully attending; growing more and more helpless and confused and frustrated; and, in extreme cases, becoming almost neurotically disorientated. They do not generally fail to secure a degree (which is probably a pity); but they certainly come away feeling that they have wasted their time at the university, and that they would have done better to do something more 'useful' — law, they murmur vaguely, or perhaps even *a science*. And, as the sad sequel to their story, they then spend weary months looking for the right kind of 'literary' job, crowding the ante-chambers of the B.B.C., the newspaper offices and the publishing firms, until they 'end up' (as they put it) in an insurance office or on the staff of a very small private school.

Generalising from the situation in English, I have hardly, I believe, exaggerated the case of the arts man who would clearly be more happily and more usefully (and presently also more remuneratively) employed in reading 'something else'. And if 'something else', why not a science — if the national need for more scientists is as urgent as we are asked to believe? It may be argued that a man 'who is too dim to pass in English' would not be of much use in a science lab. But my point is that they are not 'dim', only misfits; and they do pass, only they get too little out of the subject they have passed in to justify their spending three years studying it. Nor is it suggested that

these men will become distinguished research scientists, or anything at all remarkable. But if, as one is told, the applied sciences in particular have room for all levels of talent, it is difficult to believe that, given the proper training, they could not contribute usefully to some modest but necessary scientific project. And if (as I believe) the proportion of potential recruits to the sciences is as high as a quarter or a third of the students at present reading Arts subjects, the kind of 're-direction' that has been suggested might do something quite handsome towards meeting the national need for more scientists.

But there is, of course, a grand proviso to this grand concession to Mr. Hanson and his friends. The liberalising studies that Professor Pilley and I have been recommending must be made an integral part of the education of the scientist. They must be taken very seriously by the heads of the science faculties; they must be pursued with the same seriousness by the students; and they must be allowed as much time as is compatible with the scientists' receiving the scientific training they need. Indeed, if a 're-direction' of Arts students into the sciences were to be adopted on a national scale, there would be a strong case, I believe, for urging the universal addition of a fourth year to the normal three-year degree course in science. This would do much to ease the pressure all round; and it could reasonably, I think, be expected to be paid for by the nation, which would be the chief beneficiary of the technological progress that the increased number of trained scientists would ensure.

METADIPLOMATICS FOR THE MODERN MAN

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'WHILE everyone well knows himself to be fallible, few think it necessary to take precautions against their own fallibility.' Though written a century ago, that sweeping judgment may even now be not entirely without its point.

There are spheres of risky enterprise — the pools, for instance, and the gaming-tables — where it might be hard, even by taking all precautions, to lessen the fallibility of one's *tact des choses possibles*. But others there are — the stock market, polar exploration, politics, poker — of which this is not so true. In these the practised hand may have the surer touch.

Recently, on a reading party, students of International Relations considered three principal themes. All concerned the 'Structure' addict — seen as an ideal type. Your 'Structure' addict is one who in the days of his youth has opted for a grounding in those diplomatic elementals, imprecision in respect of which is such a source of fallibility, more especially in situations where no given line of policy is necessarily right.

With the reading party, and incidentally the Suez affair, alike so freshly in one's mind, it is congenial to be parading once again, in these respected pages, the horse of one's beloved hobby, to be consulted on what International Relations teaching, for undergraduates, is all about.

First, a semantic side-note: the distinction between 'International Relations', as the subject, and 'international relations' or 'relationships' as the matter of its concern. For it is, of course, clear that 'out there', in the fabric of the socially real, international relationships do exist, whether or not we notice them 'in here' within the circle of our academic preoccupations. Just as economic problems had been present before economics began to be taught, so have international issues existed even though no attention has been paid to them by universities and though it be still a question whether they are proper to be appreciated in universities at all. However, it is not at all a question with the likes of me, as may presently appear.

What I next would mention, though to lay it aside, is whether the term 'international relations' is not sometimes just a name for something else. Is it not sometimes, in effect, a part of History, or Political Science? For are its methods not similar to theirs? The relevant distinction is, however, not between methods of study, but between the foci of interest with which subjects are variously pursued. And Political Science in the past has, I would think, been pre-eminently concerned with the *polis,* as such: the focus of its official interest has been specifically the State. This is why some of us so stubbornly believe in the right of International Relations to recognition as a subject independent and distinct. For International Relations has so evidently its particular focus, the relationships between states, as opposed to the workings of the individual state — Government, even Comparative Government, being one thing and International Relations another. But, while committed personally to our subject as a discipline in itself, I am certainly very far from supposing that those only who so see it are entitled to my regard! For who indeed could not vindicate an interest in such a subject? Who, among the social scientists at any rate, is not properly concerned, so far as may be, to understand the social cosmos? And what is that, if it be not mankind as a whole, considered globally, and grouped, for relevant purposes, in our day, into what are broadly identifiable as 'nations' — though conceived of rather, politically, as of a plurality of 'states', describable, as a rule, and perhaps even typically so, as '*nation*-states'?

This society, this international 'family', if you will, this grouping of international 'persons' — on this planet, at this juncture — where, and by whom, is its study to be pursued? Where not? Yet in many British universities, among them some of the more ancient and famous, it has as yet no place. There are those, nevertheless, who see this subject as having in these times more importance than ever before. Even had the World Wars not marked already an epoch in history, the future, looking back, might be likely to distinguish a pre-atomic, and a post-atomic, era. For we now are apparently in for a period when our very survival is destined to depend, not so much upon the question of war, as upon the problem of the kind of peace that might bring it about. It is the question of co-existence, of social living. To this problem we have not, even in our parochial systems, yet found a full reply. Internationally, it is likewise still unsolved. But is it not becoming more urgent than ever that, of the best minds available,

more shall give their best attention to this matter, of social living in the world-wide society of states?

What, then, of International Relations as an academic subject? What sort of subject may it be? Sir Alfred Zimmern, who is so famous in this field, may have tended, I am afraid, to send some of us astray by the humility of his opinion on this point. Like us others, he sees how, to be equal to our task, we must want to be something of a historian, an economist, a philosopher, and more besides. But, not content with that, he suggests that International Relations is therefore not strictly single; but rather a 'bundle' of subjects — not one, but a bundle. And how often has he not been cited as if so having settled the matter beyond dispute! To my thinking, however, and in my experience, International Relations is a unitary subject, if only in that it exists as responding to a single need, as serving to satisfy a unitary appetite, the desire of *homo sapiens* to appreciate the kind of social world in which it is his to live. (And we can see what kind this is, namely, a world which has, diplomatically, the structure of a society of states.)

Not that the student does not, with a view to this appreciation, bring together, or depend on someone else's having done so, a multiplicity of lights, convergent from a diversity of angles. White light, we know, though resoluble into the colours of the spectrum, is none the less distinctively white: and International Relations, though revealing, on analysis, a multiplicity of ingredients — amongst others the historical, political, economic, sociological, philosophical and psychological aspects — has yet an identity of its own. There exists for adult man a distinctive need: to see, and comprehend, his social world, the situations within it, and the problems they present, not in their aspects only, but each as an integral whole: and, as this need is single and distinctive, single also is the subject, International Relations, whose role it is, so far as possible, to satisfy this need.

It has, I admit, been suggested that International Relations is so complex a matter that it ought not to invade the curriculum at less than graduate level, by which time, it is seemingly supposed, the student should have covered — sufficiently — the subjects of history, and economics, and law. To this I can but reply that my experience is all the other way. My question is not, subsequently to what, but along with, concurrently with, what other 'underpinning', 'companion', disciplines should International Relations be studied, in what undergraduate year should such study begin, and in what relationship

with such other disciplines should it be put in train? At what point in the programme can it first be with benefit brought in?

In London, we provide for it, not at one level, or at two, only, but at three. Everyone is aware that universities exist for the promotion and conduct of research; and many seem therefore to assume that there must already exist, in academic circles, persons duly equipped to be researchers in this field. Yet, I doubt if there necessarily will, unless, antecedently, they have had International Relations in their course of study when up for a first degree, or unless, not then having had it, they have afterwards made it their business so to equip themselves as if they had. Be that, however, as it may be, we do in point of fact make provision, in London, for the conduct of research.

Secondly, there is the category of those who, working for a first degree, take International Relations as their 'Special Subject', a practice known in America as 'majoring' therein. Such are our 'specialists', and for them let us hope we may always have plenty of room. But mine in this paper is a different theme: the need and, as I dare to believe, the great future for this subject as a 'subsidiary', to be taken, from the outset of their college course, by any who would wish not entirely to dismiss the world's affairs, as by simply saying that they cannot attempt to understand them. I do not ask that this subject become compulsory, for there always will, I am sure, be plenty of worthy people to take it, if it be but open to them to do so. Let them adopt, as their specialism, either Economics, or History, or what seems best; and take International Relations, concurrently, at the elementary stage. In what form? In the form of what in London we call 'The Structure of International Society'. This assumes the theoretical distinction between 'structure' and 'functioning'. We put at the beginning the main emphasis on the structure, with less immediate and systematic attention to examples of how the society works; later, as specialisers, we may concentrate rather on the functioning, though without therefore losing sight of the structure: but the first stage is — to use a big word for it — the 'cosmology', the elementary lay-out, of the social universe.[1]

[1] The London Syllabus for the subject of *The Structure of International Society*.
Context of the Study. The relevance and necessity, in the study of international relations, of the companion disciplines of history, economic geography, political theory and international law.
Basic Ideas. The notion of the State as 'person' — its perils, uses and implications. The notion of an international society — forms and bases of social solidarity on an international scale. The notion of international right and wrong — standards

With what purpose? For the purpose, not least, of primary orientation — of getting his elementary bearings within that universal milieu in which his life is to be lived. It is, I may say, rather astonishing to discover how lacking such an orientation still can be even in such as have emerged without discredit from their secondary schools. A main purpose, in a word, of our teaching of this subject is to make men's minds less socially immature. For, as Bertrand Russell has put it, the teacher is a sort of medical man, whose business it is to cure the patient of childishness. And, linked with this, as an added point in our subject's favour, is its virtue as a possible corrective to what is sometimes called the 'fragmentation' of knowledge. It is, of course, a commonplace that the more specialized a man, the less fit may he be to give judgment on anything not in his espoused field. In this he has, for example, been contrasted with the politician.

The premiss, then, for the apologetics of our study is that the citizen need not be content to resemble either the mere specialist or the mere politician. He may wish to become, not just a specialist in something, but also what in America they call a 'generalist' — for want, presumably, of a less deterrent word.

It is not merely, however, a question of housing professors of various subjects together, or having their lectures announced in a single list. It is a matter rather of encouraging the individual student to retain, although he specialize, his pristine, holistic, synoptic, vision of life, and all its problems, as a whole. Man, in his integrality, encounters his every situation in its wholeness and, if he does his

of propriety — legal, moral, ethical — in the relations between States; the role of jurisprudence and of moral philosophy in the appreciation of international affairs. The notion of a single world order — the relations between sovereignty, order and international law; theories of world-wide constitutional integration.

International Politics. The behaviour of States — the needs, aspirations and anxieties of States; and the responsibilities of statesmen: motivations of State behaviour; traditional and environmental factors conditioning the outlook of States. Internal elements — the interplay and interdependence of politics at the domestic and international levels. The mutual impact of States — means and methods of pressure in the relations between States. The grading of the Powers — the ever-shifting balance of influence and authority in diplomatic exchanges, and the factors on which it depends. States of relationships between States — points of contact, and of friction, between peoples: the conditions of misunderstanding; the basic beliefs and the ruling enthusiasms of mankind and their influence upon the attitudes of States: man's urge to make a better world and the conflicting modes of its expression.

Institutional Elements. The nature of international institutions: the architecture of institutionalized international co-operation, including devices for the attempted consolidating of peace.

thinking on it with a half of him only, and with a half only of the situation in view, he will not be squarely facing up to life. Action, to be adequate, requires recognition of problems as complex wholes, in their context as itself a whole, and his disposition so to confront things is not a foible of which the student should in effect be required to rid himself from the start. He should not, in effect, be told: since you are proposing to specialize, you must for that purpose shut your mind to the larger aspects of things. He must not be warned that, if he fail to do this, his approach will of necessity be superficial. Superficial, of course, it yet may be, but this will be due, not to the nature of his problem, but to his teachers, and to him.

Another claim, an ambitious one, to be made for this subject, touches its value, as education, in an even deeper sense. It is the sign, someone must surely have remarked, of an educated man, that he has understood to call in question his fundamental beliefs. He has been brought, in other words, to the overhauling of his premisses. Now our subject might count for relatively little were it not that, when coming to it for the first time, the student, as a type at least, may be taken as having, not an empty mind, but one replete with ideas, preconceptions, that is, and assumptions dogmatically entertained. On tricky points of morals and metaphysics, of theology and jurisprudence, no less than of strategy and psychiatrics and law, there will be surmises and suppositions claiming status as indubitable truth. It would be not least among the benefits of an education if it required a person to consider where he got his 'basic acceptances' from, and how he came to have them — those positions, namely, which he assents to without reflection, almost unknowingly, it may be. They are the premisses from which his thinking — if that must be the word for it — starts. This process is, I would hold, an element in any true education. And I am therefore, of course, not by any means suggesting that ours is the only subject in which such an exercise is desirable; I am merely saying it is one where it is virtually inescapable, in which the need for it is obvious, and accepted, from the start.

And hence the further, formidable question: By whom will such a discipline be taught? The other day, by someone speaking of a proposed new post in 'Race Relations', it was said: 'What it calls for will be someone with knowledge of economics, of biology, of history, and of sociology too: in fact a Superman. And it will be hard to find him.' I ventured to reply: 'You will indeed need a superman, but I would hardly hope to *find* him. Like the one foreseen by Nietzsche,

he will have to be bred. You want someone sufficiently aware that the individual qualified to handle the subject really does not exist, someone who appreciates what it will take if, from among the new generation, there is *eventually* to appear that category of the superman who will truly be qualified to teach.' For there is a difference between asking what person is ripe for the study of this? and what sort of person would one need to be, to teach it? Given the authentic ambition to think more realistically — whether on race questions or on matters international — you are *prima facie* fit for your chosen study: though one must hope you may have in this the aid of other, more experienced, persons themselves still perennially engaged in becoming the better equipped. Which means, of course, that they too must be students to the end.

There may — though I doubt it — exist some subjects in which, once being made a professor, it is not so very terribly important to remain alert to new insights from day to day. But in the International Relations field we shall never know, we shall never understand, enough to rest content with our existing fitness for the teaching. So as yet this will best be done by someone who, while seeing that he himself is not really the man required, knows nevertheless the standard at which to aim, and will labour to limit his disabilities more and more. Find your man of promise, be sure he desires the chance, and launch him, if need be, in a relatively minor way. That, if my advice were wanted, is the sort that I would give. Let the right man begin in the right conditions, with freedom to develop the subject as he sees it — even if on unconventional lines. There is room for various approaches: and the teacher may understand his subject differently according as his be the training of a historian, a lawyer, a philosopher or what you will. Whatever his foundational equipment, he still, having now come to this subject, can seek progressively to supplement those resources with which he has come: only let us hope that he may not for very long have to plough a lonely furrow. One must hope he may soon be enabled to enlist some fellow-cultivators of the field, each to contribute something individual, so that, in the end, they may all indeed be offering an identical subject, but doing it as a team, in the light each of his distinctive expertise.

And in what temper? Must our teacher be 'detached'? This question can arise, more or less insistently, throughout the social sciences. It is true, I believe, of Treitschke, that he had no desire for 'anæmic objectivity'. As a historian, he was content, if not proud, to

show his bias. He would not see the archives of countries other than his own, lest the purity of his interpretations should suffer harm. Now that is an understandable position. At the opposite extreme is the untenable idea that it is possible for anybody to be objective on international issues. Objectivity is not a thing one achieves. It is a standard one can aim at. It is an ideal. And the most objective teaching will be provided by him who, while aware, and not ashamed, of his prejudices, will endeavour, in his appreciations, to keep them under control. For, if he have any scientific self-esteem, he will know how to differentiate between the teacher's role and that of the salesman of a political line. So, while one may manage a certain degree of detachment, it had better be open-eyed, realistic and sophisticated, and not just a form of self-deceit.

With what expectations is your man to proceed? What, for instance, of the notion that instruction in this subject should make the novice wise. Is this a safe assumption? I doubt it. The most that can reasonably be hoped for is that the study may evoke, and help the student to develop, that share of wisdom with which he may by nature have been endowed. One cannot sow wisdom from a lecture platform or even from a study chair: but one may encourage a pupil to use what wisdom he has. And what applies thus to his judgment in general holds particularly, in its way, of his judgment in questions of morals, in matters of right and wrong.

A further point: in which of its dimensions is the subject to be advanced? How far is it to be treated as if unequivocally a 'science'? The scene of my professional activity is known as a 'school of the social sciences'; and some, I suppose, might tend from this to infer that International Relations, as with us understood, must presumably be a science and, purportedly, nothing further. But with such a doctrine I, for my part, could not be content. To my mind, it does indeed belong within the social sciences 'field'; but, while including its scientific component, it has other, philosophical, aspects also. It is as well a branch of humanistic study as of science. Yet, in so far, for example, as the teaching of it does turn on issues which demand, say, a diagnostically analytical approach, to that extent the treatment should, of course, proceed in the spirit of science. So, while the subject may well be considered scientific from the nature of what it mostly has to do, it must also be more than merely that; it is also concerned, for instance, with what is justice, what is truth, and what is man?

Question last but one: in the face of what misgivings, what resist-

ances, and even of what vested interests must this subject make its way? The truth is that the older British universities have their inherited conceptions of their task. 'What was enough for our fathers, and for us. . . .' Is not this, in effect, the attitude of rather many? There are all kinds of qualms and hesitations conspiring to retard the wider introduction of our subject. I even have heard it questioned whether its encouragement could in practice do very much to countervail the 'fragmentation of knowledge'. I have heard it questioned; but only in a dogmatic manner: I have seen no documented argument on the point. However. It is certainly in the face of considerable scepticism that this still largely unheard-of subject is bidding for further acceptance and development in the universities of today.

And now, my final question: with what urgency? It was at Utrecht, more than eight years back, that a world conference of universities gave its urgent blessing to the advice that all universities not already providing, by chairs or otherwise, for the study and teaching of our subject should as soon as possible so provide. I have, from one of the greater figures in the fight against malaria, words curiously in point. Kipling, he recalled, had judged that it was useless trying to hustle the East. His own experience, he said, was that this was true equally of the West. And that, I rather fear, is our position also, even today. We are obliged to be patient — we who believe that there is need, among the coming generation, for those who will seek to understand the world. And this requires that a man shall all his lifetime have this subject on his plate. While I would not ask for very many to be specialists in the subject, I would certainly suggest that more other sorts of students, in more of the best endowed centres, be permitted, and enabled, to make an earlier start towards an elementary awareness of the universal set-up, to serve them in the future as the basis and the context for their day-to-day appraisal of the movement of affairs. Meanwhile, when in an agonising hour the elders of the tribe get down, as in a seminar, to a case-study on a matter of vital concern, and notabilities, new, by the look of things, to 'Structure', contribute, not infallibly, to the flow of advice, it would, no doubt, on democratic assumptions, be unbecoming to raise even an eyebrow at their *hardiesse*.

This article is a revised version of a lecture given in April 1956 to the English Discussion Group of the Stockholm School of Economics.

MR. LEAVIS ON LITERARY STUDIES

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I AM glad that Mr. F. R. Leavis has found in my essay an opportunity for re-stating so trenchantly and stimulatingly his own view of literary studies at the University; and I must thank him for the invariable courtesy with which he has treated my arguments, even while bringing to bear on them his characteristic force and incisiveness. I am very willing to grant that there are unfortunate phrases and turns of expression in that essay, and, what is worse still, that the main issue it purports to discuss is neither very specifically nor very clearly stated. I would like the editor's permission to try to mend matters. But first there are one or two points that Mr. Leavis has put to controversial use, in respect of which I must defend my intention.

Mr. Leavis represents me as proposing to substitute Locke, Bolingbroke, etc., as the central authors for study, in the place of what we usually and rightly regard as the classics of English literature: Shakespeare or Marvell or Pope, Johnson or Jane Austen. But my passing reference was not intended to suggest that Bolingbroke and the rest should be shifted from the margin of study to the centre, or that a literary student need give much, or indeed any, of his time to those authors — or to many others whom I could have mentioned; authors who, as Mr. Leavis would agree, are in various ways and in various degrees of *some* interest, and who can be made on occasion to serve the purposes of those whose primary concern, whether as teachers or as students or just as common readers, is with imaginative literature — with 'literature' as ordinarily understood. As to the names I actually mentioned, they were not chosen merely at random. Mr. Leavis in his own comments has very well suggested the kind of interest in Locke and Burke that I myself would think desirable for the literary student. I added Bolingbroke because Matthew Arnold recommended his historical writings; and because on taking this hint I found him to be the master of a strong, direct, modern prose, evincing a remarkable grasp and force of mind. As for William Law, I am interested in him very largely as exemplifying a theme often explored by Mr. Leavis: the nature, significance, and influence of an age or a culture in relation to individuals who on the face of it do not conform to any received idea of what that was, and who yet can be seen in some curious respects to belong to it. Thus while Law by tempera-

ment, character and training is obviously utterly unlike Pope — his spiritual affinities being with the medieval anchorites — he still belongs plainly to 'the age of Pope' in social habit, style, and moral essence; illuminist as he is in tendency, and an earnestly practical moralist in his preoccupations, there is an odd note of the genial, the polite, the sociable, in his writing; and this seems to tell us something important, not only about Law, but about Pope: that is, about the religious and moral tradition which is at the basis of Pope's art. And I doubt whether that minor English classic the *Serious Call* is any more 'there' for the confident summarizer, the peruser of handbooks, than a great classic like *The Pilgrim's Progress*. I should add, however, that, in expressing regret that it should be neglected, I would not be taken to imply more than a dissent from the view that while Law's contemporary Steele is Literature, to be studied and lectured about and examined on, Law is not.

But my main object in referring to these neglected writers was to criticize the convention which fixes the line of literary studies so as to exclude, not only them, but the subject-matter, argument and substantial content of discursive prose in general. And I can assure Mr. Leavis that I have good reason to think that the adoption of this convention *is* sometimes associated with the cultivation of 'style' and 'form' — with the cultivation of Sir Thomas Browne and his engaging quaintness. I had in mind, that is, the promoters of that variety of 'critical appreciation' which, in effect if not in theory, is a 'soft option': a means of relaxation from the rigours of Anglo-Saxon and the like. But I was far from wishing to attribute to Mr. Leavis, or to anyone who might reasonably be said to have learned from Mr. Leavis's work, any responsibility for this kind of thing.

Mr. Leavis censures very justly my confident but ill-defined use of words like 'fact', 'intellectual', 'historical'. But I must be allowed to question his inference, from my incidental mention of a critic's mistake about *housel*, that my conception of 'fact' and 'history' is quite so simple as he says. In citing examples of this type of mistake, I was at pains to add that such linguistic changes did *not* constitute the most important kind of difficulty for the reader of old books. And I gave as an example a much more inward and subtle kind, typified by the 'frame of mind', the 'conception of purpose', of Christian devotional poetry. And surely this has its problems — problems of approach and criteria of relevance — for the mature critic as well as for the undergraduate, for the reader who shares the poet's religious beliefs and for

the reader who does not. And don't we need, especially in these times, the limited and limiting suggestion of the adjective 'intellectual', to describe what must be at least one aspect of the comprehension that has to be achieved before we can talk intelligently about these works?

My unclear use of the adjective 'æsthetic' is similarly rebuked. And I agree that it is an unsatisfactory term, and one which promotes confusion, at any rate in literary discussion. But what other accepted term *is* there to describe those qualities, features, or characteristics of a poem, a play, or a novel, which they have in common (either directly or by analogy) with a work of musical or plastic art, as against what is not supposed to be or offered as 'art'? and which they have in common with each other as against (*e.g.*) an argument considered as an argument, or a sermon as a sermon? And surely no one will dispute that these characteristics have sometimes to be distinguished. Nor that they are essential: so far from arguing, as I think Mr. Leavis takes me to do, that they are not the most important of the 'facts' about literature I insisted so much on, I took care to emphasize, in dissociating my position from that of the scholar who neglects the 'purely æsthetic' aspects of his subject, that these were usually just what made it what it essentially was; my quotation-marks were intended to be ironical.

Finally, *apropos* of my assertion that 'the standing of many great writers is simply a historical fact', Mr. Leavis (having asked who these are) goes on to relate the spirit of this remark to the emphasis on dry, dull, irrelevant externals, rather than on the essential qualities of literature, which he diagnoses as characteristic of my approach. Well, it seems to me that some, perhaps many, of the great European classics are not very alive today; Dante, for instance: his *contemporary* standing is largely based on convention — and also, no doubt, on respect for Mr. Eliot's essay. I know that Mr. Leavis does not approve of this state of affairs; he thinks that the great poem of Dante should be more effectively honoured than it is. But how? We shall agree that there are many incidental pleasures, and even highly poetic pleasures, to be got by dipping into the *Inferno* and elsewhere; but I am sure that Mr. Leavis wants to recommend more than this: more, even, than the Dante who may be said to have influenced the revised *Hyperion* or *The Triumph of Life*. Now, it seems to me that if one is not seriously interested in the intellectualist vision which characterizes Dante's poem, one is losing something essential of Dante. I certainly do not believe that Dante is so inaccessible as some

medievalists have made him out to be, but I don't agree either with someone who replied, when I argued in that strain, that a cradle-Catholic finds Dante easy because he imbibes a sort of instinctive Aristotelianism with his mother's milk. I don't believe that one can learn a way of thinking except by thinking. And mustn't one learn, at least to *some* degree, Dante's way of thinking, before the *Comedy* as a whole comes to life? This question is rhetorical; I don't wish for a moment to attribute absurd views to Mr. Leavis, but I do want to make it clear that my concern for 'history' was not a matter of insisting on externals. For the mind of Dante is not external to his poetry.

Now, suppose Dante did become, what he ought to be, one of the genuine centres of a truly vital humane school of study; and suppose one had a student who had a real interest in poetry, and was sensitive and intelligent, but who just *could* not get interested in Dante's remote and alien kind of intellectualism? A student who did appreciate the vivid dramatic quality of certain scenes and situations in the poem, and some local imaginative life here and there in the quality of the writing, but who found little else to engage his interest? (And I have a suspicion that many of those who read and enjoy Dante would have to admit, in a moment of candour, that they don't get much more than that out of him.) How could a teacher, knowing this very well, nevertheless justify the spending of any precious time on the medievalism of Dante? Surely his last line of defence (and that is what I was concerned with) would be that Dante's poem is a great historical fact; that it is more than a great medieval Italian poem, more even than a classic of European Christendom; it is a world classic; and one might suggest to the sceptical pupil that if one *was* prepared to exercise one's historical imagination one might find some 'real' (in Arnold's sense) as well as 'historical' value, not only in the author of the *Comedy,* but even in the author of the *Convivio* — who was, after all, the same man. And I can't believe that Mr. Leavis would disapprove of the spirit of that approach. In practice, of course, one would no doubt expect, and seek, to foster a much more limited kind of interest in Dante, and I don't say that that would be wrong; but one would have to make it clear in doing so that the classical standing of Dante — the 'historical fact' — depends on much more than the things which may very well be all that even an intelligent and sympathetic modern reader can find to admire in him.

All these points regard what was my main theme, considered in its

bearings on the question of literary studies: the relation between 'history' and criticism. It seems almost as if the interaction of these two were as complex as that of the Soul and Body explored in the great poem by Marvell. And may I take the opportunity of answering Mr. Leavis's question and telling him that I accept his analysis of that poem; it carries conviction immediately and finally; and that I must thank him for showing me, what I did not realise before, how great a poem it is? and that I also agree that its being the kind of great poem it is, is itself a fact of 'history'? But reverting to the general question, I am not quite clear whether Mr. Leavis rejects outright my opinion that history and criticism are separable, or whether he merely objects (fairly enough) to my somewhat obscure and elliptical way of stating it. That there *is* a distinction, I am still convinced; though I do not deny, and did not in my article, that the critic and the historian may be the same person.

I will not expatiate here on the relation between understanding and valuing, in reference to literary criticism, for I do not wish to incur again Mr. Leavis's charge of elaborating a 'dialectic' for its own sake. And anyway I find the whole subject very puzzling — as who does not, who is interested in the definition of criticism? On the one hand, valuing, in the sense which matters to the literary critic, is not simply like awarding a certificate, or affixing a price-tag; it seems to refer to something which controls from the start the whole process of critical reading; on the other hand, I cannot believe that one recognizes the value of a work by a pre-reflective intuition: the very word 'judgment' that we tend to use ('value-judgment') carries the suggestion of a reflective act, a decision. (And we might say that a valuation based on a misunderstanding of a poem is not, in an important sense, a valuation of *that* poem.) It seems, then, that understanding is, at least conceptually, distinct from valuing; that it is a prior requisite. But it does not follow from this (so to speak) logical priority, that as a temporal, psychological process 'understanding' precedes 'valuing'; and indeed I think few would accept that account, who recollect what the actual reading of a great poem is like: how it grows in the mind as the mind grows in comprehension of it, how it comes to be possessed by its reader and in turn possesses him. And so I have to grant that the distinction between understanding and valuing, as commonly stated or implied, strikes no real root in the experience of any lover of literature. There can be no doubt that Mr. Eliot, and Coleridge before him, speak for many when they declare that it is possible to admire

and enjoy and be moved by poetry which in a strict sense one doesn't, and may not even want to, 'understand'. And in the same anti-academic spirit we may retort to our self-appointed enlighteners that many of the poems they affect to explicate or surround with 'facts about' them, we *already* understand, and that any 'help' they may offer will make no difference, since we will not *let* it make any. And I can sympathize all too easily with the mood in which one answers the question: 'What is the correct text of that poem? Which is the correct interpretation?' by saying, 'That which is most beautiful; that which gives me the most pleasure'. But I also have my share of that impulse which I will not dignify by calling it anything other than *curiosity,* to find out what the poet actually wrote, and what he probably meant it to mean — if I may perpetrate this 'intentionalism' without qualification or discussion. And I can only say that I think the teaching of poetry at the University should minister at one time or another to both kinds of reader; or rather, to the same reader according to his different states of mind, and his different purposes. And the ideal historian of literature would be that reader *in excelsis.* He would be a critic; reading his authors, he would know what the actual historian so often does not know, and an unlearned poet may know: how to tell the quick from the dead. But the poet, and the critic, must have wherewithal to discriminate. And they may want other information too; wisdom is a higher and a better thing than information, but it is not the same thing; and the wise man may show his wisdom in consenting to inform himself.

I am sure that Mr. Leavis would not deny this. He is a literary historian himself; *Revaluation* is certainly literary history — its character as an experiment in historical method has been overlooked by many of its critics. But if I may, without offence, make a direct application to him of a point I glanced at in my article: Mr. Leavis, as a trained historian in a sense over and above that of 'literary historian', knows what to remember in reading the literature of the past; whilst as a critic he also knows (which may be even more important) what to forget. But one cannot either remember or forget what one has never known. And I do find, and do hear about, historical ignorance, not only in young students' work, but in mature writers. May I however assure Mr. Leavis that I was not so impertinent, in both the common and the strict senses of that word, as to imply that *his* work does not make or propose a due use of history and 'scholarship'? True, I *was* concerned about the neglect and ignorance of lower-order

'facts', a neglect not palliated by the reproduction of the language of criticism. But I never meant to be interpreted as advancing academic counter-proposals in a spirit hostile or indifferent to *Education and the University*. I had in mind, indeed, the conditions in which work in a spirit akin to that might be made possible. But I was also aware of the local situation on which Mr. Leavis had his eyes when he wrote his book, a situation somewhat different from that which faces a teacher in the English School to which I belong. And so I was thinking primarily in terms of how to make the best of what is worth preserving in the tradition of that School, with its primarily 'scholarly', linguistic, and medievalist emphasis. I believe that life could be fostered there too, for I can see no contradiction between the *ideal* purposes of the scholar and those of the critic. And there was in my mind the idea of an academic *régime* which would provide the same preliminary training for the future creative writers, professional critics, scholars, and above all the Common Readers of a better day. I specify the 'scholars' because Mr. Leavis acknowledges that scholars are necessary. We agree that, to be useful, scholarship must be informed by criticism. It must answer genuine critical questions. But if this statement is not to be a mere pleonasm, we have to assume that scholarship is not identical with criticism. And after all, it will be generally granted that there is such a thing as special scholarly training; and if scholars are to be trained, where else than at a University? I cordially agree with Mr. Leavis that a man isn't in a respectable sense 'trained' even for a special literary study if he has not a trained intelligence about literature in general. And the intended point of my article (a point that I confess could have been better put) was that the ideal first-degree course should provide at least some part of that general training. I hope that Mr. Leavis will not think that I am exalting scholarship. I know that it is too often the case that, while a critic makes a little go a long way, a scholar makes a lot go nowhere. And few of us go to the leading academic 'authority' on a great poet for *critical* illumination about him; we go to one or other of the very few original critics present and past. But we need also what we *do* go to the authority for, a good text, together with the notes and commentaries that Mr. Leavis allows to be necessary — would that we always got them!

It is only too clear that there have been eminent scholars who have done useful services to literature without having much critical ability; I need not specify instances; there is, alas, an *embarras de*

choix. But there have also been good critics who have been deficient in a historical sense. That 'history' is not enough, that uninformed by criticism it is not true history, is the moral I draw from the regretted A. J. A. Waldock's superiority to the academic champions of Milton that he strove with. But that there is none the less something distinct from the purely critical capacity, namely, a historical awareness that is needed to bring a literature, a tradition, a series of conventions, into full focus, is the further moral that I draw from the same author's very interesting but not quite satisfactory book on a Greek dramatist. This book has the critical virtues: but I must add that, while I can believe in Waldock's Milton, frankly, I cannot believe in his Sophocles.

In making these comments I have wished to defend and clarify the intention of my essay, and to try to persuade anyone who may have read it that it was not meant to be obscurantist or anti-critical. But my purpose would be defeated if Mr. Leavis, or any other reader, assumed that I am trying to score points against him. I wished rather to reassure him that my notion of literary education was not radically opposed to his — given certain differences in local situation and practicability of means to the desired ends; and that I share his sense of the importance, indeed the *necessity*, of affirming the centrality of literature — of our own literature — among the humane subjects.

In short, I do not wish to take issue with Mr. Leavis about any of the fundamental considerations on which he has laid stress. My original argument could be reduced in essence to the truism that in order to be able to read Greek poetry one must be able to read Greek. Mr. Leavis has replied, in effect, that one must also be able to read poetry; and his reply carries the further implication that knowing how to read poetry will in turn make one revise one's conception of what, in such a case, would constitute 'knowing Greek'. It would mean more, in fact, than satisfying classical examiners. But it is not contradictory to remark that that at least would be necessary; and it was explicitly not Mr. Leavis's work that I had in mind, but *inter alia* work that might be said to be derivative from it and from other critics, when I wrote several pages re-affirming this truism.

HOW UNDERGRADUATES WORK

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THERE is much discussion nowadays as to whether the time spent by students at the university is used to the best advantage. This is natural when so much public money is being spent on higher education and when so much is going to depend on the quality of students graduating from the universities. Discussions about broader education schemes, the value of residential accommodation, the use of vacations, inter-disciplinary contact between students and so on do need firmer bases of information. Do we really know, for example, how much leisure time is at the disposal of students and how they make use of it? How much time is spent in academic work, in physical exercise, in travelling, in doing nothing? How widely spread over the student body is active participation in student activities? How far do students of different departments make contact? And how does all this vary between students of different faculties and in different years, and between residential and non-residential students?

The investigation of student behaviour that I carried out at Birmingham University was an attempt to determine how and whether objective information about such questions could be obtained. The results show, I think, that similar methods of investigation could provide information more valuable than the impressions we have at present. This paper is confined to the results about the time spent in academic work during term.

In an earlier paper[1] I discussed the amount of time spent in study and employment during the vacation. The main conclusion was that the amount of vacation study was small and, contrary to opinion, was only slightly affected by time spent in vacation employment. It was also evident that students of pure science and technology did considerably less vacation study than arts or commerce students, although they compensated for this to some extent by taking practical courses or jobs connected with their subjects.

In term time, as in the vacation, science students spent less time in individual study than other students. They had, however, fuller timetables. Within the two classes, arts and science, there were differences

[1] *Universities Quarterly*, Vol. 9, No. 3. May. 1955.

in the amount of work students did, depending both on subject of study and year of course. Some of these differences are such as might be expected but some, perhaps, are not and they may provide information of value to the university teacher who has to decide when and whether it may be advisable to change the amount or character of work students are asked to do.

Method of Investigation

A stratified random sample of 370 men full-time undergraduates were interviewed by myself or my assistant, Mrs. Rosemary Somers, during the autumn and spring terms of the 1951-2 session. As far as possible this sample contained equal numbers of those living in the hall of residence, in lodgings and at home in each of the eleven 'departments' listed in Table I, and within each of three undergraduate years. In addition, 133 women, also evenly distributed between years and types of residence were chosen from arts and medical departments.

At an interview, which lasted about an hour, each student was asked to account in detail for his or her activities from the time of getting up until going to bed on the previous day (a few preliminary interviews had shown that this was the longest period for which reasonably accurate and detailed information could be obtained). Information was also obtained about main activities during the previous weekend (Saturday and Sunday). A proportion of students were interviewed twice to provide some information about day to day and week to week variation of a student's activities, and thus to give some estimate of the adequacy of information based on a single day.

The choice of sample controlled the variables year, residence and subject but it did not control the day of the week to which the interview referred or differences between social class of student. These two variables are dealt with below. There are, of course, many other variables but since subject, year and residence already provided ninety-nine classes further control of sample was impossible. The effects of these other variables have been dealt with as far as possible by the use of analyses of variance (on specially selected orthogonal sub-samples) for the significance tests whose results are referred to below. In addition, the information obtained from students who were interviewed twice has been used to test the relative importance of the controlled and the uncontrolled variables. To do this regression coefficients of second interview on first interview were calculated and

compared with regression coefficients obtained from pairs of students of similar subject, year and residence. For both 'formal' and 'informal' work (see below) the two regressions were positive and did not differ significantly indicating that subject, year and residence include the most effective variables influencing the amount of work the students did, and that a single day for each student provides adequate data on which to base comparisons between groups.

The Time Used for Work

Academic work has been classified under two main headings, 'timetable' or 'formal' work, which comprises lectures, tutorials and practical classes, and 'informal' work, that is all the work done in the student's own time.

It was comparatively easy for the student to provide accurate information about 'timetable' work and when it was necessary to jog his memory the timetable itself was available. Work outside the timetable, however, was a different and more difficult matter for students to recall, for it could occupy any length of time and occur at any time of the day. It was here that the consecutive account of all activities throughout the day was especially useful, as those activities which took place at prescribed times helped the student to recall what he did in the intervals and how long the intervals were. The free discussion type of interview was also particularly valuable in minimizing exaggeration of the amount of 'informal' work. The student's first reaction when he could not remember a period was often to say that he 'must have been working'. Questions about the type of work that he had been doing, however, often reminded him that he had been doing some odd job like repairing his motor cycle or had been out for a walk at that time or else that he could not really remember that period at all. Sometimes a student would be *sure* that he had been working but could not remember what work he had done; he was then given the benefit of the doubt and the period was counted as work. Any feeling the students may have had that they *ought* to say they had been working was largely dispelled by such discussion and by the attitude of the interviewers.

The average time spent in academic work on any weekday[1] by

[1] The distribution of time between the various activities on the different weekdays (Monday to Friday) was found to be much the same, except, of course, that there was less 'timetable' work on Wednesdays. This effect of Wednesdays has been allowed for in the following comparisons.

the men and women in the sample was $6\frac{1}{4}$ hours (12 hours was the most time spent in work by any student). Of this time $3\frac{1}{2}$ hours was spent in 'timetable' work and the remaining $2\frac{3}{4}$ hours in 'informal' work. Half an hour of this individual study period was spent in the university and the rest at home, in lodgings, or in the hall of residence. At the weekend an average of 1 hour was spent in 'timetable' work (on Saturday morning) and $3\frac{1}{2}$ hours in 'informal' work (on Saturday and Sunday together). Fifteen per cent of the students did no academic work at all on the particular Saturdays and Sundays to which their interviews referred; 11 per cent went to lectures and classes only. A quarter, therefore, of the students did no home study in the relevant weekend.

The weekday and weekend results may be combined to give an estimate of the time spent per week in work. This average termtime working week was just under 36 hours.

Departmental Differences

Table I shows the average working weeks of students of different subjects. Some of these differences are significant, the degree of confidence being such that none of the departments near the bottom of the table for men could be moved more than four places up in the order. Thus, for example, modern language men students did significantly less work than mechanical engineers and all those above mechanical engineers in the table.

Even where differences in time spent in 'total' work are not significant, there are significant differences in the relative times used for 'timetable' work and 'informal' work (Table I). On the whole arts students spent more time in individual study than science and technological students. There is, however, no consistent inverse relationship between the amount of 'timetable' work and individual study. For example, dental students had about the same amount of 'timetable' work as medical students but did less than half the individual study, and commerce students had about the same amount of 'timetable' work as general arts men students but did considerably less other work.

Students of science and arts, of course, used their 'informal' working time quite differently (Table II).[1] Scientists spent a good deal of

[1] Medical and dental students have been excluded from Table II because over 75 per cent of their time was spent in 'reading' but it was not possible to distinguish consistently between learning for 'vivas' and other reading.

TABLE I AVERAGE NUMBER OF HOURS WORK PER WEEK (INCLUDING SATURDAY AND SUNDAY) AND AVERAGE EXAMINATION RESULTS FOR STUDENTS OF DIFFERENT DEPARTMENTS

YEAR:	1			2			3				
Type of Work	*'Timetable'*	*'Informal'*	*Total*	*'Timetable'*	*'Informal'*	*Total*	*'Timetable'*	*'Informal'*	*Total*	*Years Combined*	*Average Results**
Men:											
Physics	25·9	19·7	45·6	24·5	11·8	36·3	19·4	23·3	42·7	41·5	2·9
Medicine	25·7	19·5	45·2	16·9	28·0	44·9	21·6	10·1	31·7	40·3	—
Chemistry	28·7	19·4	48·1	21·5	11·6	33·1	25·9	10·0	25·9	39·0	2·8
English and History	13·9	28·2	42·1	7·9	26·9	34·8	4·0	33·7	37·7	38·2	2·5
General Arts	17·0	23·4	40·4	13·6	22·0	35·6	8·2	28·3	36·5	37·5	2·1
Mechanical Engineering	20·7	11·2	31·9	22·3	12·0	34·3	18·0	26·4	44·4	36·9	1·4
Electrical Engineering	22·3	11·3	33·6	20·4	9·3	29·7	20·0	21·8	41·8	35·0	1·5
Chemical Engineering	24·4	11·7	36·1	20·0	7·7	27·7	20·0	20·0	40·0	34·5	2·7
Commerce	14·5	16·6	31·1	12·1	18·8	30·9	13·7	20·2	33·9	32·0	1·3
Dentistry	21·0	16·8	37·8	22·5	5·1	27·6	27·6	2·0	29·6	31·7	—
Modern Languages	6·5	19·7	26·2	12·1	25·3	37·4	6·7	20·4	27·1	30·2	1·9
Women:											
Medicine	23·4	14·9	38·3	17·6	27·4	45·0	25·5	8·6	34·1	39·1	—
English and History	16·7	17·1	33·8	8·8	27·4	36·2	5·0	35·2	40·2	36·7	2·1
Modern Languages	11·1	11·4	22·5	16·3	24·1	40·4	11·0	26·3	27·3	33·4	1·7
General Arts	17·5	15·9	33·4	10·4	21·2	31·6	9·5	19·4	28·9	30·6	1·3

Note:

English and history and the different modern languages had to be combined to provide large enough samples. Commerce includes students of commerce, economics, politics, sociology and accounting. General arts includes various combinations of languages, English, history, physical education, etc.

*For explanation, see text page 180.

TABLE II

CLASSIFICATION OF 'INFORMAL' WORK

Percentage of Total 'Informal' Working Time for each Department

TYPE OF WORK: *Department*	*Preparation for Tutorials; Essays; Translation and Grammar*	*Laboratory Reports and other work connected with Practical Drawing*	*Working out Problems or Examples*	*Sorting, Copying and Looking at Lecture Notes*	*Reading*	*Unspecified*	*'Set' Work as Percentage of Total 'Informal' Work*
Men:							
Physics	7	16	23	21	30	3	46
Chemistry	9	18	9	29	35	—	36
English and History	57	—	—	—	42	—	57
General Arts	42	—	—	3	55	—	42
Mechanical Engineering	—	26	49	9	15	—	75
Electrical Engineering	—	25	18	21	31	5	43
Chemical Engineering	6	39	19	11	26	—	64
Commerce	29	—	15	4	52	—	44
Modern Languages	67	—	—	—	33	—	67
Women:							
English and History	47	—	—	1	50	2	47
Modern Languages	57	—	—	8	36	—	57
General Arts	49	—	—	2	46	3	49

this time writing up laboratory experiments, studying lecture notes and working out problems, whereas arts students spent much less time on their lecture notes but a correspondingly large amount of time on essays and translations.

It is clear that most of the time spent in 'informal' work was spent on work that was 'set'. Apart from 'sorting notes' all the work that was not 'set', in a rather strict sense, comes in the column headed 'reading', which includes looking up references in the library and getting books out. This occupied about 24 per cent of the 'informal' working time of engineers ($3\frac{1}{2}$ hours per week), 33 per cent of the time of pure scientists (5 hours), 44 per cent of the time of arts men and women and 53 per cent of the time of commerce students (9 hours). It would have been interesting to have found out how much of this time was spent on 'reading round the subject' and how much on set books but this was not practicable.

Differences between the Years[1]

Students of most departments did least work in their second year and most work in their first year (Table I). In general they had less 'timetable' work in their second year than in their first and 'timetable' work was further reduced in their final year. There was, however, a greater difference between the years in the time used in 'informal' work. Second year students did least 'informal' work and third year students did most. Leaving out engineering, modern language, medical and dental students, who differed more or less extremely from this general pattern, second year students did $6\frac{3}{4}$ hours a week less work than first year students. Of this $3\frac{1}{2}$ hours was 'timetable' work and $3\frac{1}{4}$ hours was 'informal' work. Third year students did $4\frac{1}{4}$ hours a week less than first year students. This figure results from a decrease of $5\frac{1}{4}$ hours 'timetable' work and an increase of only 1 hour 'informal' work.

Engineers did relatively little 'informal' work in their first year (about half as much as pure scientists). Modern language students did more 'formal' and 'informal' work in their second year than in either first or third. Medical students worked least in their third year (not of

[1] For convenience, years are called first, second and third, but for pure and applied science, medical and dental students these refer to Courses II, III, and IV. Course I (that is Intermediate, 1st M.B., etc.) students were not interviewed for it was a pre-honours year, and numbers were small and most students came straight into Course II in their first year in the university.

course their final year) the decrease being largely in 'informal' work. Dental students did so little 'informal' work in their third year that despite a five-hour increase in timetable they worked no more in their third year than their second. Commerce students worked uniformly through the years. There was also a large difference between the amounts of 'informal' work done by final year chemists and physicists.

Conclusions

This investigation has provided some quantitative facts about the time spent in academic work during term and has made it possible to compare students of different kinds. Some of the results seem to be contrary to popular belief. It is, for example, often suggested that students of scientific subjects have to do more work than arts students. The science students in this sample did in fact have fuller timetables but students of English, history and general arts did correspondingly more 'informal' work and therefore did about the same amount of academic work as physicists, chemists, engineers and medicals. Similar beliefs are often expressed about the amount of work done by women versus men or by students of different social class, but such beliefs find no support from the data which show no significant differences between these groups (apart from general arts men and women, but general arts is a heterogeneous group).

It is believed that students do least work in their second year and this is true on the whole of the students in the present sample. This smaller amount of work in the second year is usually put down to the fact that students do not have their most important examinations in this year. The exceptional behaviour of medical and modern language students supports this view for these two groups did have important examinations in the second year and did a correspondingly greater amount of work.

Perhaps more surprising is the finding that students of most subjects did more work in their first year than in their final year. There may, of course, be many reasons for this, such as the adjustment to the changeover from school to university work, the lack of knowledge of how much work is required and the fear of failure at the examination at the end of the first year. Also students must take some time to acquire interests in alternative university activities.

Two other observations concerning work done in the different years need mention. First, it seems striking that physicists and chemists differed so much in their third year, though in their first and second

years they were similar. In their final year they had different but not greatly different amounts of 'timetable' work (chemists 26 hours per week, physicists 19 hours) but the physicists did twice as much 'informal' work as the chemists (chemists 10 hours, physicists 23 hours) so that their total working weeks differed notably.

Second, the technologists stand out as the only group who did least 'informal' work in their first year; they did very little more total work in their first year than their second year, but in their third year did more than most students. One factor which differentiates them from other first year students is the less direct relation between their first year work and their ultimate work, for in their first year some of their time is spent on chemistry, physics or mathematics and it may be that this results in a certain lack of interest. Some of the technologists did express this point of view in their interviews. Whatever the cause, the lack of attention to their first year work is perhaps unfortunate for it is understood that some industrialists complain that the technologists they employ are often deficient in their training in the basic sciences.

Though there is no evidence of consistent difference between students of the faculties of arts and science (apart from the difference in distribution of working time between 'timetable' and 'informal' work and of the character of 'informal' work) there were considerable differences between the time used for work by students of different subjects. The average working week ranged from about 30 hours to about 40 hours. Thus the data might be taken to suggest that the amount of work required to qualify in different subjects differs considerably and that in so far as *quantity* of work needed is a measure it was easier for modern language or commerce students to obtain a degree than for students, for example, of English, history, physics or chemistry. Such a conclusion however, would be unjustified unless it could be shown that the students of different subjects obtained similar examination results: but this is not so. Table I gives the average working week (averaged over the three years) for students of different subjects, together with the average result of the students in their final examination. (The average examination result is obtained by scoring 4 for a 1st, 3 for a 2a, 2 for a 2b, 1 for a 3rd and 0 for a fail.)

Apart from technologists there is a fairly clear relation between examination results and the amount of work done by the students of a subject regardless of sex. There is insufficient data to test the significance of this relationship but it would seem plausible to conclude that it is not variation of the ease with which a degree may be obtained

that accounts for the differences of the amounts of work done by students of different subjects.

Technologists do not fit into the general picture, and among them chemical engineers, who did least work, obtained the best results. Here it seems that either the quality of the students or the standards of the examinations must differ.

Dental and medical examination results are not comparable with those of other subjects, but may be compared with each other. Despite the great difference in the amount of work they did, these medical and dental students obtained similar results. It would seem possible that dental students might need less time to qualify if they could be persuaded to work as hard as medical students.

These conclusions are strictly applicable only to a sample of students in Birmingham in 1951-2. They should be regarded as tentative since the investigation was in the nature of a 'pilot' survey. There had been no previous detailed enquiry to use as a basis for its design. Nevertheless, some of the conclusions seem interesting and show that the technique of investigation, improved as a result of experience gained in this 'pilot' study, could be used to throw light on specific problems about which decisions have to be made by university staffs often without adequate information.

I wish to acknowledge the co-operation of the undergraduates and staff of the University of Birmingham, the support of Sir Raymond Priestley and Professor H. F. Humphreys and the valuable assistance with the field work given by Mrs. Rosemary Somers.

REVIEWS

An Historian's Approach to Religion. ARNOLD TOYNBEE. *Oxford University Press,* 21*s.*

While Dr. Toynbee was still at work upon his monumental *Study of History,* he became convinced (and more strongly after the Second World War than ever before) that the History of Religion could not only not be ignored but must be singled out as the central thread in the vast and intricate pattern he was engaged in presenting. And not the History of Religion only: the problem of what is to be our present attitude to religion — this too, he came to feel, must be confronted. The invitation he received from the University of Edinburgh to deliver the Gifford Lectures in 1952 and 1953 gave him the incentive and the opportunity, and this book is the final outcome. He might, he tells us, have gone on trying to ignore the religious question indefinitely if he had thought his growing preoccupation with it was merely a personal affair. But, in his own words, 'I believe that in finding myself pursued by this question I am having one of the characteristic experiences of the living generation in the Western World. We have been reminded of Religion by the quickening touch of Adversity.'

It should be clearly understood by any intending reader that the present book, though approachable as an independent work, is in organic relation to the mighty fabric and therefore presupposes it. No one will grudge to such a master-builder as Dr. Toynbee the use of a terminology peculiar to himself — such as 'civilizations of the second generation', 'idolized parochial state', 'Late Modern Western', 'Imperial ("Melchite") Catholic Church', and the like. Still, anyone who has not read *A Study of History* may at first be intimidated by these and other technical terms of which the esoteric meaning is immediately clear only to initiates. He may well, also, be dazed by the effort to focus his myopic eyesight to the panoramic (not to say sidereal) prospects which unroll before him. In Dr. Toynbee's godlike vision the 'Upper Palæolithic Age' is 'but a few tens of thousands of years ago'; he tells us, in passing, that 'when we read the Sumerian Epic of the Creation in the Babylonian version' we shall find our sympathies veering round as we watch the transfiguration of Ti'amat —especially in 'the last fifty lines of Tablet IV'; he speaks casually of 'the Maccabaean successor-state of the Seleucid successor-state of the Achaemenian Empire'; he is as much at home in Najaf, Qazimayn or Mashbad as he is in Delphi, Jerusalem or Rome. In fact, the

reader who sets out with Dr. Toynbee on this Everest expedition must expect no easy time. The journey is long and encumbered; the pace slow and relentless; the omniscient guide grave and exacting.

But to him that perseveres to the end, what rewards! Once the language has become familiar and the main features in the panorama have begun to emerge, the difficulties lessen and the rest of the journey is completed with mounting exhilaration. For, after all, there is in this account of man's spiritual history a certain grand simplicity — the outcome not only of a lifetime's watching over man's mortality but also of a temperament essentially religious. Dr. Toynbee, although he is emancipated from all local orthodoxies, including the Christian, is deeply committed to the 'truths and counsels' underlying all the higher world-religions, and above all to the central affirmation that there is an Absolute Reality, a real Presence, behind the flux of appearance, and that the supreme lesson we must learn is how to lose our rebellious, separate selves and find true fulfilment in obedience to the heavenly vision. He is not only not afraid to use the Christian doctrine of Original Sin: he makes it the starting-point of his high argument. Original Sin means, for him, the inveterate self-centredness of man, whereby he sees the Universe converging upon his own Self, his own clan, tribe, class or nation, and seeks to subdue all other Selves to his own lust for power. The belief that the very meaning and purpose of human existence lies in overcoming Original Sin is not something extraneous to Dr. Toynbee's thought; it was forced upon him by his work as a historian. The 'feat of breaking out of an inherited self-centredness' is in fact the historian's specific achievement, though (as he admits) it can never be more than partial. Dr. Toynbee, it will be agreed, has probably gone as far towards achieving the historian's ideal detachment as it is possible for a human being to go. Indeed, orthodox Christians will probably accuse him of having gone too far, for from his lofty vantage-point any claim by Christianity and other religions to uniqueness or finality is seen as a 'reversion to the self-centredness that is the hall-mark of "Original Sin" '. 'The historian's point of view', he writes, 'is not incompatible with the belief that God has revealed Himself to Man for the purpose of helping Man to gain spiritual salvation that would be unattainable by Man's unaided efforts; but the historian will be suspicious, *a priori*, of any presentation of this thesis that goes on to assert that a *unique* and *final* revelation has been given by God to *my* people in *my* time on *my* satellite of *my* sun in *my* galaxy'.

It is impossible in any brief summary to do anything approaching justice to Dr. Toynbee's argument: without his wealth of illustration and his depth of allusion half its compulsive power is lost. There are, he teaches, only three possible objects for man to worship: Nature, Man himself, and God — understanding by 'God' the Ultimate Reality in that personal aspect which has been recognized by all the seven higher religions except Hinayana Buddhism. Though all three of these cults have overlapped, and still do to this day, Nature-worship comes first in order of development, Man-worship next, and God-worship last. When man has subdued Nature to the point of losing his primitive fear of her personified forces, he transfers his worship to an idolized form of human power, the 'parochial community' (tribe, city-state or nation-state) and its personification as tutelary divinity. The endless conflicts between these self-centred units prepare the way for idolization of the 'œcumenical community' — empires such as the Achaemenian, the Chinese, the Roman, the Ottoman, symbolised by Divus Cæsar and his equivalents. These empires, though bringing the priceless gift of peace within their own frontiers, failed to satisfy man's deepest spiritual needs, and the higher religions emerged, pointing to a reality transcending both Nature and Man.

By the higher religions Dr. Toynbee means the three Buddhaic religions: the Hinayana, the Mahayana, and post-Buddhaic Hinduism; the three Judaic religions: Judaism, Christianity, and Islam; and Zoroastrianism. These religions were 'higher' than others because, instead of trying to evade or suppress Suffering, they accepted it as inescapable and used it as the occasion for 'acting on feelings of Pity and Love' which they believed to be 'divine as well as human':

> 'In following the lead of Love, Man will be exposing himself to Suffering, because he will be swimming against the current of self-centredness. But the new gospel tells him that, in exposing himself to Suffering for Love's sake, he will be swimming, not against, but with, the main current of the Universe, because an Absolute Reality which, in one of its aspects, is the True God, is a Love which has expressed itself in self-sacrifice . . .'

The Hinayana, indeed, taught deliverance through extinction of the self rather than through love and pity, but even in this religion the practice rather than the precept of Gautama is followed — the example, that is, of refusing to save himself until he had saved others.

Even these higher religions have been in various degrees 'captured'

for 'alien mundane purposes', and 'diverted from their true mission'. The mediæval Respublica Christiana came near, for a time, to reversing this process and capturing the kingdoms of the world; but when this promising enterprise collapsed, at the beginning of our Modern Age, there came a disastrous recrudescence of the idolatrous worship of parochial States, from which the West has never recovered.

Part II of Dr. Toynbee's book is the larger of the two main sections, and contains most of the new material (new in the sense of not being condensed, like much of Part I, from *A Study of History*). It concentrates attention upon the Seventeenth Century as the crucial period of modern history when Western Civilization 'broke out of its traditional Western Christian chrysalis' and invested its spiritual 'treasure' in Technology. At that time, and for 250 years afterwards, this seemed far from being the act of apostasy that it now begins to appear. Christianity was so discredited by internal conflict, and by the wars of religion, that the conquest of nature for the glory of God and the relief of man's estate seemed not only innocent but laudable, pious, and indeed the God-given line of escape from the *odium theologicum*. By following this line, too, the West gained an immense and seemingly permanent lead over the other civilizations. As long as Science remained the pursuit of a few virtuosi who preferred to study God's Work rather than to wrangle over his Word, and as long as Technicians (now idolized in a revived Man-Worship) were merely conquering disease, irrigating deserts, or 'annihilating distance', there were no misgivings. The other civilizations hastened to learn Western techniques and to assimilate them as best they could to their traditional patterns of living. In the end, they began to imitate Western culture in a wider sense, but did so just at the tragic moment when Mephistopheles was returning, after a lapse of 250 years, to claim the soul of a Faustian world which had forgotten its old contract with him. Original Sin, conveniently ignored during that long holiday of the Western conscience, has forced itself back upon our attention through the wars and other horrors of our lifetime, and most of all through the possibility that man's evil deeds, outrageously magnified by atomic energy, might annihilate humanity and even dissolve the great globe itself. Dr. Toynbee sees the logic of events moving towards world-government in the form of an ecumenical empire which, for the first time in history, will embrace the whole world. Like his less learned fellow-creatures he can only hope that mankind may achieve this without destroying itself in the process.

In any case, whether now or in a supposed world-empire, religion will, he thinks, relieve the claustrophobia created by the ever increasing curtailments of individual liberty which the future will inevitably bring. By a strange reversal of the seventeenth century situation (as described by Spratt), 'God and the Soul', instead of being tabooed in a scientific Eden, will be the only remaining escape from a scientific Hell. But Dr. Toynbee does not defend religion only on grounds of political or psychological expediency. He also believes that the religious interpretation of the world has as much right to recognition as the scientific — indeed, has *more* right, since in the profoundest intuitions of all higher religion lies our only peace and the true meaning and purpose of existence.

Though Dr. Toynbee's religious outlook cannot, like that of lesser men, be readily classified, he could be described as belonging to the tribe of Ben (Jowett) and of those 'modernists' of today who believe that it is now 'an obviously urgent task for us to disengage the essence in Mankind's religious heritage from non-essential accretions'. Many orthodox Christians will cavil at his view of what is 'essence' and what 'accretion', for under the latter he includes all those translations from the language of the spirit into the language of science or metaphysics to which so many are still committed. They will not like his brilliant definition of Theology as the 'monument of an encounter between [pagan] "intellectuals" and missionaries'. Most of all will they resent his central affirmation, conveyed by every device from hint, implication and tone to final plain-speaking, that the time has come for all the world-religions to pool their spiritual treasure, abandoning — each one, including Christianity — that claim to uniqueness and finality which is their one remaining touch of Original Sin. They will applaud, however, when he says that 'The time has come for us . . . to wrench ourselves out of the seventeenth-century mathematico-physical line of approach which we are still following, and to make a fresh start from the spiritual side.' And none should either cavil or applaud, but listen with humility to the wisdom and insight which thus declare themselves:

> '. . . the unceasing struggle which is an inescapable accompaniment of human life in this World is, in truth, a struggle to extinguish our self-centred desires and to follow the lead of our self-devoting desires at whatever the price may be. The price turns out to be Suffering to an extreme degree. The pain to which we expose ourselves through Love is still greater than the pain to which we expose ourselves

through Cupidity. In the judgement of Christianity and the Mahayana, even the extremity of Suffering is not too high a price to pay for following Love's lead; for, in their judgement, Selfishness, not Suffering, is the greatest of all evils, and Love, not release from Suffering, is the greatest of all goods'.

BASIL WILLEY

Science and Civilisation in China, Vol. 2: History of Scientific Thought. J. NEEDHAM. *Cambridge University Press,* 84*s.*

In seeking to analyse the essential characteristics of China's civilisation attention is generally directed to such matters as the unemotional character of her religious beliefs, the intense awareness of the oneness of man and nature, her art of painting, which has captured the imagination of mankind, and the beauty and significance of her system of writing — the calligraphy which is one of the loveliest creations of the human spirit and which has had so great an influence in moulding and unifying the mind of the Chinese people; and gradually one comes to realise that the difference between what men call east and west is not nearly so wide or so deep as the gulf which divides China from all other civilisations past and present. It is in the Chinese conception of the nature and function of law that one may hope to find the clue to that complex of mental and social habits which distinguishes the people of China from the rest of mankind, but Dr. Needham does not seem to have understood the works dealing with this aspect of his subject that are referred to and quoted in this volume.

Civilisation was not imported into China by invaders from a foreign land; it grew up on the Great North China Plain where the Chinese who settled down to cultivate the fertile loess soil were faced with the problem of the Yellow River, that Demon of Destruction flowing down from the mountains of Central Asia and Tibet. So much silt and grit is carried down that the bed of the river is higher than the land on either side and devastating floods can only be prevented by a system of dykes and canals extending for many hundreds of miles, well planned and carefully maintained. The survival of the village communities depended, therefore, on their capacity for harmonious co-operation over wide areas under the guidance of trained and trusted leaders. That is the origin of the profound respect for learning and contempt for the use of force in human affairs which are so deeply

rooted in the Chinese mind. It is also the reason why as Arthur Waley has pointed out, China did not evolve along the road of the rule of law and control by a dominant group in their own interests but along the road of welding all classes, sections and interests into one harmonious whole held together by a community of ideas and beliefs. W. F. Mayers points out that

> the foundations of the Chinese state repose upon an all pervading officialdom, a bureaucracy trained through the national system of education to apply the maxims of government enunciated centuries before the Christian era.

The political organisation thus established continued without substantial change until the fall of the Manchu Dynasty in 1912. It has been described as a million village republics where there was no centralised control and devolution of responsibility took the place of the rule of law.

In the early centuries of the Christian era devolution of responsibility was applied to the communities of foreign merchants who lived at the trading centres on the coast and this was the origin of the treaty ports and extraterritorialty established in the 19th century. W. F. Mayers has described the Chinese government as he saw it in operation at the end of the 19th century:—

> The central government of China, so far as a system of this nature is recognised in existing institutions, is arranged with the object rather of registering and checking the action of the various provincial administrations than with that of assuming a direct initiative in the conduct of affairs . . . Regulations indeed of the most comprehensive character are on record for the guidance of every conceivable act of administering and the principal function of the central government consists in watching over this system of rules . . . The central government may be said to criticise rather than to control the 21 provincial administrations wielding, however, at all times the power of immediate removal from his post of any official whose conduct may be found irregular or considered dangerous to the stability of the state.

And this is what Sir Rutherford Alcock wrote in 1867:—

> Each province constitutes a separate state in its own administration. It has, under a Governor General, its own budget, collects its own taxes, levies its own duties, remitting only a stipulated amount or proportion to Peking for the public service and the Palace. It has its own militia and pays all the civil and military employees within its limits, making reports to Peking from time to time on all these heads. Each province with its Governor General and large body of Mandarins is practically as independent in all that concerns its internal

> administration as a Federal State in America . . . The Emperor can appoint and remove every official from the Governor General downward at his pleasure; and they are all, individually and collectively, held responsible for all that may happen within the limits of their jurisdiction and this wholly irrespective of any fault on their parts . . . and they are made answerable in purse and person for what no human effort or prevision could have prevented.

Devolution of responsibility was based on the belief that the nature of man is inherently good and that if the right methods of persuasion are employed men will willingly carry out their mutual obligations in society. Therefore, as a distinguished Chinese scholar has recently explained,

> the scheme of education, the method of government and all social appliances have for their aim and object to educate men to the sense of moral obligation.

In such a system there is no place for the western idea that rights should be guaranteed by law nor is there any place for the civil and commercial codes which occupy so vast a space in western legal systems. Codified law is purely penal and sanctions are primarily means of intimidation. The Pillars of the State are the Four Confucian Virtues, *Li, I, Lien,* and *Ch'ih*. The first and greatest of these is *Li,* which means Courtesy and Good Manners. *Li* also means Rites and Ceremonies and the *Li Chi,* the Book of Rites, is one of the Confucian Classics which, under the national system of education, every child had to learn by heart. The *Li Chi* prescribes not only the ceremonies for such matters as marriage, funerals, mourning and the cult of ancestors, but even the etiquette of daily life. So great is the importance attached to right behaviour that the attempt is made to prescribe in minute detail the behaviour suitable for every conceivable situation that may arise. In the Chinese Criminal Code (*Ta Ch'ing Lü Li*) every conceivable crime is catalogued and the function of the Judge who tries the case is to fit the facts to the right section of the code leaving the ultimate penalty to the decision of a superior court. The Collected Institutes of the Manchu Dynasty (*Ta Ch'ing Hui Tien*) provide an even more remarkable example of the belief in the efficacy of classifying, arranging in order and regulating in minute detail. In this enormous work, occupying when bound in European style, no less than 76 volumes of Folio size, every detail of the Chinese polity is anticipated and provided for. Regulations are set forth by which every act of the Imperial government, from the daily move-

ments of the Sovereign to the conduct of the lowest official functionary, is strictly bound to be guided.

This elaborate organisation of society has for its aim to educate men to the sense of moral obligation. The functions of every individual are registered and docketed in order to ensure that he shall fit in to his right place in the social order and willingly perform the obligations that are expected of him. Every human being is caught up in a network of rites and ceremonies, of rules and regulations, but the regulations that are promulgated are not law in the western sense of the term. A law in China is an exhortation which sets up an ideal standard of conduct, and failure to attain the standard is followed by further exhortations. Punishment is not imposed unless the failure becomes a menace to society. Normally it is not intended that obedience should be enforced by the action of the state, nor is it intended that the state should intervene to settle disputes or differences of opinion. The normal procedure is that disputes are composed by the friendly advice of neighbours or the arbitration of guilds or Chambers of Commerce. If a dispute is brought into the Court of the District Magistrate it is a sign that the vast social organisation, expressly designed to promote harmony and avert conflict, has in this instance broken down. Litigation is discreditable to all concerned — to the plaintiff and the defendant for their failure to find some friendly way of composing their dispute, and, in the last resort, to the Magistrate himself for his failure to maintain by example, education and exhortation the moral tone of the District committed to his charge. 'As an arbiter in litigation', said Confucius, 'I am no better than other men, but surely the grand object to achieve is that there should be no litigation at all'.

When Dr. Needham speaks of the 'isolation of China's civilisation' one is reminded of the headline in the *Daily Mail,* 'Great Storm in the Channel. Continent Isolated'. He does not mention devolution of responsibility but he suggests that this 'isolation' may be the reason why the Roman idea of *jus gentium* was never adopted by the Chinese.

Chinese art, philosophy and literature are permeated by the feeling that the world of man and nature is one indivisible whole. The two great schools of philosophy, Taoists and Confucians, believe that behind the physical universe is an impersonal first cause or prime mover — the *Tao* or Way — which brings all things into existence by a synthesis of two opposites, the *Yin* and the *Yang*. The aim of

Confucian philosophy is to discover how men can best be persuaded to live in harmony with their fellow men, while Taoism poses the problem of man's adjustment to the universe. The founder of Taoist philosophy was Lao Tzu who expounded in the *Tao Te Ching* the doctrine of inactivity — *wu wei*, do nothing and everything is done. This doctrine served a very useful purpose when it was applied to the social order and not pushed to extremes, for it helped to curb the interfering activities of an overzealous bureaucracy. The same idea is found in the teaching of Confucius. Yao and Shun were the two Model Rulers of antiquity and, according to Confucius, 'Shun was one who did nothing yet governed well. Religiously self observant he sat on his throne and that is all'.

The Taoist philosophers believed that man should subordinate himself to the *Tao* of nature, seek a lessening of desires and by a process of meditation and self discipline achieve a state of calmness and contentment with the simplicities of nature. From this Taoism drifted into search for the elixir of immortality, alchemy, divination, magic and traffic with supernatural beings; it adopted superstitious beliefs and practices and degenerated into a religion which is now slowly dying out. Confucianism declined from time to time into pedantry and formalism but it always recovered from these cycles of decay and the Confucian civilisation of China, to which Taoism has made its contribution, has continued through the ages to win the admiration of mankind.

Dr. Needham maintains that for 2,000 years China was under the sway of 'Imperial absolutism' ruling through a 'feudal bureaucracy' with an ideology which was a 'synthesis of legalist and Confucian principles'. In fact, of course, both legalism and feudalism had disappeared before the Christian era but this version of history provides a basis for the theory that it was the intolerant domination of the Confucian Mandarins that made it impossible for the Taoists to develop modern science. 'In their beginnings magic, divination and science were inseparable' (P. 57), Taoist philosophy 'became overlaid with magic and superstition', and 'when it more and more appeared that feudal bureaucratism was destined to be the characteristic form of Chinese society they glided imperceptibly into a heterodox religious mysticism' (P. 98). 'Conducting a socialist holding action for 2,000 years and condemned to perpetual heterodoxy Taoism had to retain unborn within itself science in its fullest sense.'

Western scholars have always believed that the long delay in the

development of science as we know it in the west was the result of the Chinese attitude to nature and they regret, as do most Chinese scholars, that this attitude became so distorted in the minds of great philosophers that it inspired the attacks on knowledge in the *Tao Tê Ching* and other works. 'In days of old those who practised Tao with success did not by means of it enlighten the people but sought to make them ignorant' (*Tao Tê Ching,* Ch. 65). 'The sage rules by emptying their minds and filling their bellies' (*Tao Tê Ching,* Ch. 3). Dr. Needham attempts to explain this away by saying that these and other Taoist texts are not attacks on true natural knowledge, 'not anti-rational mysticism, but proto-scientific anti-scholasticism', but 'these proto-scientific tendencies have been overlooked by all European expositors, its political significance has been understood by none' (P. 86). Dr. Needham refers to certain 'technical terms which most Chinese and all European expositors have failed to appreciate' (P. 113) and to certain passages in the *Tao Tê Ching,* which 'Chinese commentators failed to understand and their failure in turn set western exponents almost without exception on the wrong track' (P. 57). Even Chu Hsi, 'the greatest of all Chinese thinkers' did not understand the passages in the *Tao Tê Ching* that he criticised. The Taoist attacks on knowledge 'deceived even the elect, as for instance Duyvendak, Creel and Maspero' (P. 88), and 'Taoist thought has been almost completely misunderstood by most European translators and writers'. Dr. Needham is perturbed by the 'distinct prejudice against technology and invention' which he finds in Taoist texts, but, 'in their anti-technology complex the Taoists surely represented the popular feeling that whatever machines or inventions might be introduced it would only be for the benefit of the feudal lords'. (P. 124.)

It is astonishing that Dr. Needham should believe that evil thinking of this kind ever entered the minds of the Chinese people. But his book contains so many conflicting and often completely contradictory statements that it is difficult to discover what it is that he really believes. For example, on page 543 he says that the Taoists were 'seeking to go back to primitive tribal collectivism where nothing was formulated or written down', and one reason why science had to remain on a purely empirical level was the 'tendency of the Taoists to regard the *Tao,* the cosmic order in all things, as inscrutable for the theoretical intellect'. These admissions make nonsense of all that he says about the Taoist attacks on knowledge some 400 pages earlier.

Many people have been looking forward to the great work on

China which Dr. Needham plans to complete in seven volumes. They will be disappointed when they read this volume, for in neither scholarship nor sinology does it reach the standard they have been led to expect.

JOHN PRATT

Graduate Employment. A Sample Survey. *P.E.P.*, 30*s*.

The acute shortage of qualified personnel of all grades has been the recurrent theme in most post-war discussions and there are few who are still ignorant of the fact that skilled manpower is the most scarce of all our productive resources. The universities have responded to the challenge by a remarkable expansion in all faculties (there are now 81,600 students instead of the 49,000 pre-war) and the State has done its part by financing the operation, partly through its grants to the universities themselves and partly through awards to students who could not otherwise have afforded the cost of prolonged study. A large proportion of the community's most able children now goes to a university; but the demand for graduates, particularly for scientists and technologists, is still considerably ahead of supply. What happens to graduates when they have taken their degrees? What jobs do they go into? And why?

Before this survey was undertaken we were extremely ignorant on the matter. Most of us in the universities know that our graduates are rapidly snapped up and we have a good idea of the kind of work they go into; but we had no material from which to piece together a more general picture, and this pioneer study is, therefore, very welcome. It was undertaken by P.E.P. at the request of the Department of Scientific and Social Research, and covers the university experience, school background and subsequent careers of 4,000 men from the time they graduated in 1950 until 1954, when the survey was made. As the main stimulus to the enquiry was the shortage of graduates and particularly of scientists and technologists in productive industry, the survey was confined to men in the faculties of arts, science and technology, as other faculties such as medicine, dentistry, agriculture, etc., were not considered sufficiently germane to industry to justify inclusion. But within the chosen faculties the coverage was exceptionally wide, for the questionnaire was sent to one in every two of those who graduated at any university or through a university college in Great Britain in the academic year 1949-50; and as 66 per

cent completed forms were received it is unlikely that there is any significant bias in the information collected.

Of these men, over half were arts students, a little over a quarter were in science and a fifth in technology; but there was great variation in different universities. Oxford and Cambridge had 78 per cent in arts, 14 per cent in science, and only 8 per cent in technology, whereas London and the other English universities had 40 per cent in arts, 34 per cent in science, and 26 per cent in technology. Just over half of all the graduates in these faculties went into industry and teaching (30 per cent and 23 per cent respectively), the Civil Service took 8 per cent and the rest were scattered among various callings and professions in groups of 4 per cent and under. The jobs they took were, of course, influenced by the subject read; two-thirds of the technologists and two-fifths of the scientists went into industry compared with only an eighth of the arts men. On the other hand, one-third of the arts graduates became teachers.

How and when were these choices made? Did the men come up with a definite plan for the future? Did they take advice from others? Did they get the jobs they had hoped for or drift into something else?

The answers to these questions cannot be precise, for people are often unaware of the factors that have pulled them in one direction or another. 'Taking advice' or 'being influenced' may suggest a formal consultation to one man or it may mean the effect of many informal contacts to another. Different students must have interpreted the question in different ways. But as far as one can accept the answers to the questionnaire as valid evidence, it seems that half of these graduates had made up their minds before entering the university (it must be recalled that this group included a fairly large number of ex-Service men) and the rest decided during the course, generally in the last session. The really surprising thing is that two-thirds insisted that they had had no advice nor been influenced by anybody in their decisions. Significantly this proportion is considerably less for those who had been educated at Public Schools, more than a fifth of whom had been influenced by their parents compared with only 12 per cent of those from Grammar and other schools. This seems to point to the fact that many of those who would probably have been unable to get to a university without financial assistance live in something of what the survey calls a 'social vacuum'. Probably no other member of the family had been educated at a university and they had no family knowledge or experience on which to draw. In these circumstances it

is worth noting that they were evidently unable to get this help from any other source, for only 6 per cent were influenced by the advice of a University Appointments Board, and very slightly more by a Professor or Tutor.

It may be that the difficulty in learning something about employment possibilities played a big part in the choice of a career, for whereas two-thirds of technologists and one-third of scientists put industry as their first choice, only 9 per cent of arts men expressed this preference, and for them teaching came highest on the list. Whether this would have been so if the method of entry into industry had been so well marked for arts men as it was for technologists and scientists it is impossible to say. But it is at least probable that the problem of how to set about getting oneself into an industrial post may have induced many arts men who would have liked this type of work to exclude it as being too unrealistic a preference.

This survey contains so much new and valuable material that it is impossible to summarise it in a short review without being reduced to a meaningless jumble of figures. But there are one or two facts which are of particular interest at the present moment. The first that emerges is the slight extent to which members of different faculties meet in extra-curricular activities. Apart from clubs devoted to sport, only a minority of graduates had taken part during their college life in any activity which was not closely associated with the subject they were reading. Only a fifth of those in technology had joined a society concerned with art, literature, music, drama or politics, and the proportion of scientists was little more; and whilst a large proportion of arts men had taken part in these societies, only 5 per cent of them had joined a scientific society. When we think what stress we usually lay, in our evaluation of university life, on the broadening effects on the minds of students of opportunities for discussion with those studying in other fields than their own, these figures should make us pause to ask ourselves whether we are talking sense or not. It is, of course, true that many students have lively and stimulating discussion with others in informal ways and without joining any particular society; but, particularly in those universities where a large proportion of the students are non-resident there is, at least, a very strong tendency for people to choose their closest friends from amongst those they constantly meet in classes and laboratories, and it is probable that the small membership of clubs other than those connected with work

means that there is, in fact, very little of that cultural interchange of which we in the universities are accustomed to boast.

The second problem that strikes the reader is the paradoxical situation in which we now find ourselves in the effort to increase the number of university graduates, and especially scientists and technologists. Universities are only the third stage in the educational process, and must depend on the kind and quality of the pupils turned out by the secondary schools. Students who have had mediocre and uninspired teaching during their most formative years are unlikely to have acquired either the intellectual discipline or the lively, critical and analytical approach required of the university man. Yet only 5 per cent of those who went into teaching had themselves got First Class degrees, and, of those teaching science and mathematics, nearly two-thirds had nothing more than a third or a pass. Are these likely to cultivate the needed qualities in their pupils?

It is not the lowness of the starting salary that is at fault here, for it may come as a surprise to learn that teaching was beaten only by the Armed Forces in the amount earned by the young graduate. But the other occupations — industry, commerce, Civil Service, Local Government, etc. — all of which began behind teaching, had caught up and overhauled it within three or four years. Yet it is doubtful whether any possible salary scale in teaching could outbid industry in its demand for scientists and technologists or offer anything like the same lucrative jobs to the ambitious.

This leads one to question how far graduates are being wisely used in industrial work. Employers, like any other group, tend to follow fashion, and there is a possibility that some of the glamour for science graduates comes from firms that have little understanding of what such men know or are capable of doing. It is certain that a great many women science graduates are employed in jobs which have no need for such high qualifications, and which could be as well done by those who had reached the Advanced Level; and it is very likely that a considerable proportion of men are being similarly wasted on work below their capacity. The present survey throws no light on this problem, and it is good to know, therefore, that P.E.P. proposes to turn its attention to this vital matter. Its further report on the policy and practice of industrial undertakings in employing graduates will be eagerly awaited.

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Aristotle's Poetics. HUMPHRY HOUSE. *Rupert Hart-Davis,* 9*s* 6*d*.
The Harvest of Tragedy. T. R. HENN. *Methuen,* 25*s*.

One of these two books on tragedy can only be briefly described here. *Aristotle's Poetics* is a course of lectures delivered by the late Humphry House to freshmen reading English at Oxford. House set out to justify the prominent place still assigned to Aristotle in literary studies today and to explain his terminology; and, with his usual clarity, he provides a most helpful exposition of his subject, though his claims for Aristotle seem a little excessive.

Mr. Henn, too, begins with a chapter on the *Poetics,* but a chapter of questions rather than answers. From here he moves on to an exploratory survey of theories about tragedy and the pleasure 'proper' to it, and then passes in review a series of dramatists from Shakespeare to Yeats and Anouilh. While it contains much that is stimulating and suggestive, especially his remarks on the rhythm of tragedy and his chapter on the Dublin theatre, his book is hard to come to grips with, partly because of the vast scope and abstract nature of much of the argument and partly because Mr. Henn takes at times a disconcerting pleasure in the possibility of endless permutations of interpretation of any given play or topic.

The main thesis of Mr. Henn's book is metaphysical, or religious. He assumes that there is a tragic 'fact' or philosophy, and, although he refuses to identify the experience of tragedy with Christianity, he maintains that the two are near and complementary to each other, in that the basic theme of tragedy is *hubris* and the final effect of tragedy is a sense of exaltation, in spite of the suffering portrayed. 'The emergence of evil through personality into action', he says, 'is the theme of tragedy.' Clearly, such an argument will command a considerable degree of assent; yet it is difficult to find it quite convincing or satisfying as it stands. For comedy also deals with ethics and with *hubris*; and when, to distinguish the two types of drama, Mr. Henn emphasises the transcendental aspect of tragedy, its 'spiritual assertion that man is splendid in his ashes', he drops the ethical part of his argument into the background. Moreover, he fails, I think, to meet the objection that a constant feature of tragedy is the spectacle of a suffering that appears at once unavoidable and undeserved. He suggests that there may be common ground between the final impression left by tragedy and the doctrine of redemption, but this part of his thesis is hard to follow.

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Mr. Henn has a second, psychological or anthropological, line of approach, however, pointing not to any resolution of the problem of suffering in tragedy, but to the strange emotional serenity the spectacle can leave behind it. Tragedy, he argues, satisfies an instinctive human demand for ritual; through archetypal symbols in the poetry and the action, it 'releases important elements in the subliminal consciousness'. Here, Mr. Henn's comments are fascinating but elusive. He brings out traces of submerged ritual in tragedy, such as the slaying of the Old King in *Lear*. But the mere presence, or shadow-presence, of such symbolism can hardly confer value or even specific meaning on any particular play; and Mr. Henn leaves the impression that quantity of symbolism is what he is after, rather than dramatic function. Again, this approach, highly suggestive as it is, stops short of marking any general distinction between tragedy on the one side and comedy or melodrama or ritual, pure and simple, on the other. If such a distinction can be drawn, it must surely stress and isolate the artistic purposes embodied in the few thoroughly impressive tragedies we have, those of Shakespeare and the Greeks. Otherwise, there can be no effective difference between literary criticism and philosophy or group psychology.

If this contention is sound, then Mr. Henn's book has undertaken too little and too much. Too little, by neglecting the Greeks in favour of modern playrights whose work, on his own showing, is not strictly tragic; and too much, by pursuing a tragic philosophy beyond and apart from the few essential moments of high achievement in the history of the theatre.

L. G. SALINGAR

Taboo. FRANZ STEINER. *Cohen and West*, 18*s*.

The ill-health which prevented the late Franz Steiner from doing the field-work which most social anthropologists consider essential permitted him to engage in a kind of research which perhaps the modern emphasis on field experience has undervalued. The mass of material which he left, only a part of which has been published, demonstrates the essentially complementary nature of field research and what is sometimes called 'arm-chair anthropology'. The present posthumous work, edited by his pupil and friend Dr. Laura Bohannan, reveals an excellent critical mind bringing to bear the understandings of contemporary social anthropology upon some of the classics of the subject.

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One is frequently asked by non-anthropologists for a short list of suitable books introductory to the subject, and *Taboo* is a work which one will in the future recommend. The word *tabu,* however loosely used, has entered the English language, and to that extent Dr. Steiner's discussion of it has an immediacy which a more esoteric topic would lack. Steiner makes the interaction of the word as commonly used in English with the primitive behaviour which it was intended to describe one of the underlying themes of the book. Thus the chapter which begins a lengthy discussion of Robertson Smith is entitled 'A Victorian Problem'. The modern anthropologist prides himself on having done away with ethnocentricity and prejudice, but Steiner makes him constantly aware of the ease with which the words he endeavours to use objectively can betray paucity in his own experience of understanding. Criticising Margaret Mead, for instance, he points out that her discussion of *tabu* reveals a limitation in the field of religious experience which, while not completely invalidating the observations, hampers the understanding of religious phenomena. In addition to the popularity of the word *tabu* and the literary critical method used, the book has the further advantage for the general reader that much of the discussion is centred upon the Old Testament, which again is part of the experience of the non-specialist.

Apart from this general interest the book is of value to those who want to know what social anthropology is about, for its exposition and discussion of various theorists. The actual topic discussed becomes, from this point of view merely convenient as having excited the interest of writers and observers since Captain Cook introduced the word to Europe in 1784. A discussion of the theories of Robertson Smith, Tylor, Frazer, Lévy-Bruhl, and in our own time, Radcliffe-Brown is a history of the development of the subject.

I cannot say that a new theory of *tabu* emerges from this discussion, and it was not Dr. Steiner's intention that it should. I would say, rather, that almost all his authorities are treated as he describes his treatment of Frazer:

> This is not, strictly speaking, a sociologist's criticism, but rather an attempt by one who is convinced of the sociological irrelevance of Frazer's theories to stir them up a little in order to be stimulated by them.

We might add that if this is not 'sociological criticism' it is necessarily prior to such criticism.

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The word *tabu,* together with a few other words from primitive languages such as *totem, mana* and also some English words such as magic and witch-craft, were, in the past, taken from the social contexts in which they had meaning and applied to behaviour in other societies which only superficially resembled the original behaviour. In reaction to this, later writers either rejected such categories or, as Steiner says, redefined them 'and by this process they became so narrow as to lose all significance outside the individual analytical study to which they were tailored'. If, however, we reject such words, we still stand in need of expressions 'indicating the direction of our interest'. In fact, Steiner points out, we retain these categories but with the result that 'each of us in his own way makes the unpleasant discovery that he is talking in two different languages at the same time and, like all bilinguals, finds translation almost impossible'. These traditionally accepted words must, then, be examined not in order to discover what they mean but rather to discover some part of man's social behaviour allied to but more closely defined than the traditional meaning. Throughout his discussion Steiner stresses two points, firstly our behaviour to the valued object is similar to our behaviour to the feared object, and secondly, that the word *tabu* has most use when it refers to 'the institutional localisation of danger, both by the specification of the dangerous and by the protection of the society from endangered, and hence dangerous, persons'. It is with these words that the book closes, and appropriately so, since they suggest a line of enquiry which might banish the word *tabu* altogether from sociological writings.

One important lesson to be learnt from this work is not merely that a current word may be only a crude description of a subtle fact, but also that its very existence can confuse us and direct our attention away from the total fact of which the word only describes a part. The reader feels that he is closest to the core of the problem in a brief discussion centred upon the words *qodesh* (holy) and *chol* (common) in the Hebrew Old Testament. Steiner, quoting N. H. Snaith, points out that for the Jews the charge made by Ezekiel (Ezekiel xxii, 26) was not that the priests had profaned the sacred places, but that they had made them common and ordinary, they had 'put no difference between the holy and common'. Snaith would maintain that *qodesh* may be used as the word 'holy' is used in English, to refer 'to the manifested characteristics of the One God'. Steiner insists upon relationship and not manifestation as the primary implication of *qodesh,*

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and on this point only differs from Robertson Smith in showing that the relationship extends beyond man to places and dedicated things. '*Qodesh* is, for the man of the Pentateuch, unthinkable without manifestation. Furthermore, it is a relation, and what is related to God becomes separated from other things, and separated implies taboo behaviour.' Steiner does not develop this any further, nor can we do so in the course of a brief review. The point that we wish to make is that the structural apprehension of religious phenomena which he here displays is not only the basis of any sociology of religion but also provides an insight into a complex of facts far more subtle than any in which the word *tabu* can have any use.

D. F. POCOCK.

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Horatio Palavicino was born to position and fortune. His family had belonged for many generations to the aristocracy of Genoese commerce; and after 1566, his father Tobias, a close business associate of Battista Spinola, enjoyed the farm of the Papal alum mines at Tolfa at a time when Europe could call on virtually no other sources of supply of mordants for the dyeing of cloth.

This windfall Tobias exploited to the full by sending members of his family to strategic points where they might supervise distribution throughout Europe. To Antwerp, the crucial market, he sent Horatio. There Horatio seems to have acquitted himself well. Since the alum farm was only for twelve years, however, Tobias set about forcing

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the Pope to a renewal by accumulating stocks with which to destroy the profits of potential farmers, and by suing for import monopolies with important customers so as to close markets to the Pope's nominee.

Tobias gave Horatio the task of propitiating Burleigh and others with a view to monopolising the English market. While Horatio negotiated, the Pope engaged a new farmer—the Altovici of Florence. Then pressure from competitors destroyed hopes of an English monopoly. Meanwhile the Palavicini, Horatio by now pre-eminent among them, won an import monopoly into the Low Countries by banking on a Dutch win in the rebellion against Spain, and lending alum to the States General in return for this monopoly and bonds for repayment underwritten by the Queen of England and the City of London.

All this time Horatio made himself useful to Walsingham and Burleigh, by supplying political intelligence, and by transferring money to continental allies, as, with his international connections, he well might. In this respect he assumed the rôle relinquished by Gresham in 1575.

But this was not all. Having taken the precaution of naturalising himself, and of seeing the wisdom of the English church settlement, Horatio was able, with his international contacts, his aristocratic family connections and personal gifts, to insinuate himself into court circles to the extent of being appointed to lead the German embassy in 1586, with money provided to pay for an army to invade France.

Ambassadorial posts came to an abrupt end in 1592; the Exchequer annuity ceased in 1593. Horatio died in 1600, but not before he had acquired a knighthood, and estates where he could lord it over the tenantry with the panache of an established member of the English squirearchy; an odd consummation for an Italian merchant with aristocratic forebears, but one which, in Mr. Stone's view, renders his life, if not typical, at least 'highly symptomatic of the age of Elizabeth.'

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